

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



Reserve  
A99.9  
E 7684



U. S. DEPT. OF AGRICULTURE  
NATIONAL LIBRARY

DEC 27 1963

CURRENT SERIAL RECORDS

# U.S. Department of Agriculture

# 1964 BUDGET

## EXPLANATORY NOTES

**FOREST SERVICE**



## PREFACE

### Project statements -

The obligations shown in the project statements are on the basis of the appropriations and activities proposed in the 1964 Budget Estimates. In some project statements, the activities are further divided into sub-categories, reflecting a more detailed description of the work conducted under the appropriation items.

Obligations reflected as subcategories in the project statements, while generally obtained from accounting records, in some instances represent the best approximation available. Wherever it has been necessary to distribute costs to activities for which total amounts cannot be taken directly from the accounts, every effort has been made to allocate such charges as accurately as possible based on other available information such as past experience, special studies, cost analyses, etc.



# C O N T E N T S

	<u>Pages</u>
<b>FOREST SERVICE:</b>	
Purpose Statement .....	1
Forest Protection and Utilization .....	8
Forest Roads and Trails .....	84
Access Roads .....	91
Acquisition of Lands for National Forests, Special Acts .....	93
Acquisition of Lands for Wasatch National Forest .....	97
Acquisition of Lands for Superior National Forest .....	99
Acquisition of Lands for Cache National Forest .....	101
Cooperative Range Improvements .....	102
Assistance to States for Tree Planting .....	103
Administrative Provisions .....	105
Roads and Trails for States, National Forests Fund .....	108
Expenses, Brush Disposal .....	109
Forest Fire Prevention .....	111
Restoration of Forest Lands and Improvements .....	113
Payment to Minnesota (Cook, Lake, and St. Louis Counties)	
from the National Forests Fund .....	114
Payments to Counties, National Grasslands .....	115
Payments to School Funds, Arizona and New Mexico .....	116
Payments to States, National Forests Fund .....	117
Working Capital Fund .....	118
Cooperative Work, Forest Service .....	119
Statement of Obligations Under Allotments and Other Funds .....	121
Passenger Motor Vehicles and Aircraft .....	124



## FOREST SERVICE

### Purpose Statement

The Forest Service is responsible for promoting the conservation and wise use of the country's forest and related watershed lands, which comprise one-third of the total land area of the United States. To meet its responsibility the Forest Service engages in three main lines of work, as follows:

1. Management, protection, and development of the National Forests and National Grasslands. The 186 million acres of national forests and national grasslands are managed under multiple use and for sustained yield. Under these principles natural resources of outdoor recreation, range, timber, watershed, and wildlife are utilized in a planned combination that will best meet the needs of the Nation without impairing productivity of the land. These management and utilization principles were recognized in the Multiple Use-Sustained Yield Act of June 12, 1960 (Public Law 86-517, 74 Stat. 215).

In managing the National Forests, technical forestry is applied to the growing and harvesting of timber crops. Estimated harvest through timber sales in the fiscal year 1963 is 9.7 billion board feet. Grazing of approximately six million head of livestock is scientifically managed to obtain range conservation along with the use of the annual growth of forage. Watersheds are managed to regulate stream flow, prevent floods, and provide water for power, irrigation, navigation, and municipalities. Management includes the handling of more than 100,000,000 visits of people to the National Forests for recreation purposes. Scientific management is applied to the extensive wildlife resources. Receipts from timber sales, grazing permits, land rentals, and water power permits exceeded \$114 million in 1962.

The protection of the National Forests includes the control of forest fires, which numbered 11,233 in the first eleven months of the calendar year 1962; the control of tree diseases and insect epidemics; and the prevention of trespass.

The major development activities of the National Forests are reforestation, revegetation, construction of roads, recreational facilities, housing, and other necessary improvements and land acquisition and exchanges.

2. Forest Research. The Forest Service conducts research in the entire field of forestry and the management of forest and related ranges. This includes the growth and harvesting of timber, its protection from fire, insects, and diseases, the protection and management of watersheds, and improved methods for development and management of recreation resources. It conducts studies in forest economics, marketing of forest products, and a survey of the present extent and potential growth and use of the Nation's forest resources. It also conducts research to develop new and improved products from wood, to increase efficiency of utilizing forest products, and to advance the efficiency and mechanization of forestry operations. Results of research are made available to owners of private forest and range lands, to public agencies which administer such lands, to forest products industries, and to consumers.

The Forest Service cooperates with the Agricultural Research Service of the Department by reviewing and appraising for technical adequacy forest research projects beneficial to the United States which are conducted abroad. These projects are carried out with foreign currencies under Section 104(k) of Public Law 480, as amended, and the dollar expenses of the Forest Service in connection with this work are paid from the appropriation "Forest Protection and Utilization."

3. Cooperation with State and private forest landowners is provided by the Forest Service to obtain better fire protection on the 450 million acres of State and privately-owned forest lands, and to stimulate development and proper management of these forest lands.

The Forest Service is also responsible for carrying out the provisions of Section 401 of the Agricultural Act of 1956 (16 U.S.C. 568e), by providing assistance to the State Forester or equivalent State official, through advice, technical assistance, and financial contributions for increased tree planting and reforestation work, in accordance with plans submitted by the State and approved by the Secretary of Agriculture.

Other work related to forestry includes:

4. Insect and disease control. Activities to suppress and control destructive insects and diseases that threaten timber areas include two types of work carried on jointly by Federal, State, and private agencies: (a) Surveys on forest lands to detect and evaluate infestations of forest insects and infections of tree diseases and determination of protective measures to be taken, and (b) control operations to suppress or eradicate forest insects and diseases, including white pine blister rust.
5. Flood Prevention and Watershed Protection. On National Forest lands and on non-Federal forest lands within the watersheds authorized for treatment by the Department of Agriculture under the Flood Control Act of December 22, 1944, the Forest Service plans and installs watershed improvement measures, in the form of minor physical structures, cultural measures, and intensified fire control, to retard runoff and reduce flood water and sediment damage. Work on non-Federal land is carried on in cooperation with the Soil Conservation Service and the appropriate State and local agencies.

The Forest Service also cooperates with the Soil Conservation Service, appropriate State agencies and the local organizations sponsoring small watershed protection and flood prevention projects initiated under the Watershed Protection and Flood Prevention Act of 1954, as amended, in planning and installing forestry and related measures on the watersheds and in inter-agency studies of proposed water and land resource developments on river basins for the purpose of obtaining integrated resource development programs.

6. Work performed for others. The Forest Service is frequently called upon to perform services for other Federal, State, and private agencies on a reimbursable or advance payment basis. Examples of these activities are:
  - a. Protection of other Federal and non-Federal forest lands intermingled with the National Forests.
  - b. Disposal of slash resulting from sales of timber and the rehabilitation of such areas.
  - c. Construction and maintenance of roads, and other improvements.
  - d. Research investigations in forest, range, and water management and utilization problems.
  - e. Cooperative survey, mapping, administrative, and reforestation projects, etc.
  - f. Cooperation with defense and mobilization agencies on forest production and utilization projects, and related work.

The Forest Service maintains its central office in Washington with program activities decentralized to 10 Regional Offices, 128 Forest Supervisors' offices, 805 District Rangers' offices, 10 Forest and Range Experiment Stations, and the Forest Products Laboratory. On November 30, 1962, the Forest Service had a total of 27,030 employees including 651 full-time and 14 part-time employees in the central office and 21,728 full-time and 4,637 part-time employees in the field. The November 30 employment figures for the field are lower than average for the year because of seasonal factors. At the peak of the last field season the number of full-time employees was about 33,600 plus about 9,300 part-time and casual employees.

	Estimated Available, <u>1963</u>	Budget Estimates, <u>1964</u>
Appropriated funds:		
National forest and other land management appropriations	a/ \$191,260,000	\$217,846,000
Research	25,605,000	23,798,000
Cooperation with States	<u>16,878,000</u>	<u>16,943,000</u>
Total appropriated funds (excluding permanent appropriations)	a/ <u>233,743,000</u>	<u>258,587,000</u>

a/ Includes proposed supplemental of \$7 million for Forest roads and trails and \$1,714,205 available from prior year balances.

Note: In addition, approximately \$27,120,000 is available in fiscal year 1963 for regular Forest Service programs in qualifying areas, under the Accelerated Public Works Program, by transfer from the Department of Commerce.



Summary of Appropriations, 1963, and Estimates, 1964

Appropriation Item	Estimated Available, 1963	Budget Estimates, 1964	Increase (/ or Decrease (-)
Forest protection and utilization:			
Forest land management .....	\$142,030,000:	\$150,656,000:	/\$8,626,000
Forest research .....	25,605,000:	23,798,000:	-1,807,000
State and private forestry cooperation .....	15,878,000:	15,943,000:	/\$65,000
Total, Forest protection and utilization .....	183,513,000:	190,397,000:	/\$6,884,000
Forest roads and trails .....	a/ 44,500,000:	66,400,000:	/\$21,900,000
Access roads .....	b/ 2,000,000:	- - :	-2,000,000
Acquisition of lands for national forests, Special Acts .....	30,000:	70,000:	/\$40,000
Acquisition of lands for Wasatch National Forest .....	- - :	20,000:	/\$20,000
Acquisition of lands for Superior National Forest .....	c/ 2,000,000:	- - :	-2,000,000
Cooperative range improvements ...	700,000:	700,000:	- -
Assistance to States for tree planting .....	d/ 1,000,000:	1,000,000:	- -
Expenses, brush disposal (perma- nent) .....	9,000,000:	9,000,000:	- -
Roads and trails for States (permanent) .....	10,900,000:	12,000,000:	/\$1,100,000
Forest fire prevention (permanent)	e/ 20,000:	20,000:	- -
Restoration of forest lands and improvements (permanent) .....	f/ 196,000:	100,000:	-96,000
Payment to Minnesota (permanent) .	125,432:	128,000:	/\$2,568
Payments to counties, national grasslands (permanent) .....	425,000:	437,500:	/\$12,500
Payments to school funds, Arizona and New Mexico (permanent) .....	80,500:	100,000:	/\$19,500
Payments to States, national forests fund (permanent) .....	27,235,140:	30,000,000:	/\$2,764,860
Total .....	281,725,072:	310,372,500:	/\$28,647,428
Deduct permanent appropriations (shown in detail above) .....	47,982,072:	51,785,500:	-3,803,428
Total (excluding permanent appropriations) .....	g/ 233,743,000:	258,587,000:	/\$24,844,000

a/ Includes proposed supplemental of \$7 million.

b/ In addition, \$1,128,629 available from prior year balances.

c/ In addition, \$472,192 available from prior year balances.

d/ In addition, \$7,486 available from prior year balances.

e/ In addition, \$1,800 available from prior year balances.

f/ In addition, \$7,400 available from prior year balances.

g/ In addition, prior year balance of \$105,898 available under the item  
"Acquisition of lands for Cache National Forest."

Proposed Adjustments in the Functional Project Structure  
for the National Forest Protection and Management Activity  
of the Forest Land Management Subappropriation  
and the Forest Research Subappropriation

National Forest Protection and Management:

Mineral claims, leases, and other land uses. This project item is being divided into two project items to more clearly reflect the nature of work planned in these activities:

Mineral claims, leases, and special uses.  
Land classification, adjustments, and surveys.

Rehabilitation of burns. This project item is being merged with the soil and water management item. The burn rehabilitation work is actually a part of the soil and water activity and has been treated as such in the Development Program for the National Forests. It is therefore appropriate that this consolidation be made so that the total activity can be more clearly described and so that work can be more effectively planned and accomplished.

Payments to Employees Compensation Fund. Public Law 86-767 (5 U.S.C. 785), enacted September 13, 1960, provides that reimbursement will be made to the Employees Compensation Fund, Department of Labor, for benefit payments made from that fund to employees of the Forest Service who are injured while in the performance of duty subsequent to December 1, 1960. For fiscal year 1963 this cost was nominal (\$28,728) as only the portion of the fiscal year costs subsequent to December 1, 1960 were for consideration. This amount was included in the Forest fire protection project item. Since the amount for inclusion in the 1964 budget is \$519,655, and since it is not possible to relate such costs directly to individual programs, this expense has been set out as a separate project item.

Forest Research:

Project items have been added to the various forest research activities to more clearly present the nature of the research program and its related financing. The following activities are involved:

Forest and range management research. Five project items have been added:

Forest management research; Watershed management research; Range management research; Wildlife habitat research; Forest recreation research.

Forest products and engineering research. Two project items have been added:

Forest products utilization research; Forest engineering research.

Forest resources research. The Economics research project item is divided into two project items:

Forest products marketing research; Forest economics research.

The adjustments are summarized in the following table:

(Based on fiscal year 1963 appropriations)

Project Item	1963 Appropriation	Change	Totals in proposed revision
National Forest Protection and Management:			
Timber resource management:			
Sales administration and management .....	\$23,000,000:	- -	\$23,000,000
Reforestation and stand improvement .....	15,130,000:	- -	15,130,000
Recreation-public use .....	25,920,000:	- -	25,920,000
Wildlife habitat management ....	3,400,000:	- -	3,400,000
Range management:			
Management .....	4,680,000:	- -	4,680,000
Revegetation .....	2,640,000:	- -	2,640,000
Improvements .....	3,160,000:	- -	3,160,000
Soil and water management .....	4,460,000:	<del>f</del> \$1,050,000:	5,510,000
Mineral claims, leases, and other land uses .....	7,140,000:	-7,140,000:	- -
Mineral claims, leases and special uses .....	- -	<del>f</del> 3,534,000:	3,534,000
Land classification, adjustments, and surveys .....	- -	<del>f</del> 3,606,000:	3,606,000
Forest fire protection .....	21,600,000:	-28,728:	21,571,272
Structural improvements for fire and general purposes (construction and maintenance) ....	12,050,000:	- -	12,050,000
Rehabilitation of burns .....	1,050,000:	-1,050,000:	- -
Payments to Employees Compensation Fund .....	- -	<del>f</del> 28,728:	28,728
Subtotal .....	124,230,000:	- -	124,230,000
Deduct amount advanced from "Cooperative Range Improvements":	-700,000:	- -	-700,000
Total, National Forest Protection and Management .....	123,530,000:	- -	<u>a/</u> 123,530,000

(Based on fiscal year 1963 appropriations)

Project Item	1963 Appropriation	Change	Totals in proposed revision
Forest Research:			
Forest and range management research:	10,121,000:	-10,121,000:	- -
Forest management research .....	- - :	<del>5</del> 5,957,000:	5,957,000
Watershed management research ...	- - :	<del>2</del> 2,256,000:	2,256,000
Range management research .....	- - :	<del>1</del> 1,013,000:	1,013,000
Wildlife habitat research .....	- - :	<del>5</del> 507,000:	507,000
Forest recreation research .....	- - :	<del>3</del> 388,000:	388,000
Subtotal, Forest and range management research .....	10,121,000:	- - :	10,121,000
Forest protection research:			
Forest fire research .....	1,461,000:	- - :	1,461,000
Forest insect research .....	1,722,000:	- - :	1,722,000
Forest disease research .....	1,525,000:	- - :	1,525,000
Subtotal, Forest protection research .....	4,708,000:	- - :	4,708,000
Forest products and engineering research:	4,683,000:	-4,683,000:	- -
Forest products utilization research .....	- - :	<del>4</del> 4,477,000:	4,477,000
Forest engineering research .....	- - :	<del>2</del> 206,000:	206,000
Subtotal, Forest products and engineering research .....	4,683,000:	- - :	4,683,000
Forest resources research:			
Forest survey .....	1,571,000:	- - :	1,571,000
Economics research .....	1,202,000:	-1,202,000:	- -
Forest products marketing research .....	- - :	<del>7</del> 709,000:	709,000
Forest economics research .....	- - :	<del>4</del> 493,000:	493,000
Subtotal, Forest resources research .....	2,773,000:	- - :	2,773,000
Forest research construction .....	2,550,000:	- - :	2,550,000
Total, Forest Research .....	24,835,000:	- - :	<u>a/</u> 24,835,000

a/ Excludes anticipated supplementals for pay act costs.





(a) Forest Protection and Utilization

	<u>Forest Land Management</u>	<u>Forest Research</u>	<u>State and Private Forestry Cooperation</u>	<u>Total</u>
Appropriation Act, 1963 .....	a/\$139,400,000	\$24,835,000	\$15,830,000	a/\$180,065,000
Transferred to "Opera- ting expenses, Public Buildings Service, General Services Administration" for space rental .....	-352,000	- -	- -	-352,000
Proposed supplemental, 1963, for increased pay costs .....	2,982,000	770,000	48,000	3,800,000
Base for 1964 .....	a/142,030,000	25,605,000	15,878,000	a/183,513,000
Budget Estimate, 1964 .	a/150,656,000	23,798,000	15,943,000	a/190,397,000
Increase or decrease ..	<u>+8,626,000</u>	<u>-1,807,000</u>	<u>+65,000</u>	<u>+6,884,000</u>

a/ In addition, \$700 thousand is available by transfer from "Cooperative Range Improvements."

SUMMARY OF INCREASES AND DECREASES, 1964

Forest land management:

For timber sale administration and management, to increase the volume of timber sold and cut .....	+5,250,000
For additional payments to the Employees Compensation Fund .....	+491,000
Subtotal .....	<u>+5,741,000</u>

Forest research:

Decrease resulting from nonrecurring construction items contained in 1963 appropriation .....	-2,550,000
For pay act costs pursuant to P.L. 87-793 .....	<u>+3,693,000</u>
Total increase, Forest Protection and Utilization .....	<u>+6,884,000</u>

PROJECT STATEMENT

Project	1962	1963 :(estimated):	Increase or Decrease		1964 :(estimated)
			Increased	Other	
			Pay Costs :(P.L. 87-793):		
1. Forest Land					
Management:					
a. National forest:					
protection and					
management:					
(1) Timber					
resource manage-					
ment:					
(a) Sales					
administration					
and management	\$22,900,073	\$23,688,000	+\$662,000	+\$5,250,000(1)	\$29,600,000
(b) Reforestation					
and stand					
improvement ....	12,371,719	15,415,000	+275,000	- -	15,690,000
(2) Recreation-					
public use .....	21,081,787	26,397,000	+463,000	- -	26,860,000
(3) Wildlife					
habitat manage-					
ment .....	2,554,826	3,491,000	+89,000	- -	3,580,000
(4) Range resource					
management:					
(a) Management	4,570,084	4,853,000	+167,000	- -	5,020,000
(b) Revegetation:	2,437,458	2,682,000	+38,000	- -	2,720,000
(c) Improvements:	2,930,537	3,213,000	+47,000	- -	3,260,000
(5) Soil and water:					
management .....	5,379,614	5,636,000	+124,000	- -	5,760,000
(6) Mineral claims:					
leases, and					
special uses ....	2,694,613	3,634,000	+106,000	- -	3,740,000
(7) Land classi-					
fication, adjust-					
ments, and					
surveys .....	3,951,872	3,723,000	+117,000	- -	3,840,000
(8) Forest fire					
protection .....	19,122,775	22,045,000	+450,000	- -	22,495,000
(9) Structural					
improvements for:					
fire and general:					
purposes (con-					
struction and					
maintenance) ....	12,833,464	11,854,000	+154,000	- -	12,008,000
(10) Payments to					
Employees					
Compensation					
Fund .....	- -	29,000	- -	+491,000(2)	520,000
Subtotal .....	112,828,822	126,660,000	+2,692,000	+5,741,000	135,093,000

(Continued on next page)

Project	1962	1963 (estimated)	Increase or Decrease		1964 (estimated)
			Increased	Other	
			Pay Costs (P.L. 87-793)		
Deduct amount advanced from "Cooperative Range Improve- ments" .....	-700,000	-700,000	- -	- -	-700,000
Subtotal, National: forest protection and management ..	112,128,822	125,960,000	+2,692,000	+5,741,000	134,393,000
b. <u>Fighting forest:</u> <u>fires</u> .....	39,717,642	5,000,000	- -	- -	5,000,000
c. <u>Insect and</u> <u>disease control:</u>					
(1) White pine blister rust control .....	3,288,729	a/3,500,000	+60,000	- -	a/3,560,000
(2) Other pest control .....	6,380,782	b/7,070,000	+133,000	- -	b/7,203,000
Subtotal, Insect and disease control .....	9,669,511	10,570,000	+193,000	- -	10,763,000
d. <u>Acquisition of</u> <u>lands (Weeks Act)</u> ..	298,179	500,000	- -	- -	500,000
Total, Forest Land Management .....	161,814,154	142,030,000	+2,885,000	+5,741,000	150,656,000
2. Forest Research:					
a. <u>Forest and range:</u> <u>management</u> <u>research:</u>					
(1) Forest manage- ment research ..	5,869,652	6,148,000	+184,000	- -	6,332,000
(2) Watershed management research .....	2,109,968	2,329,000	+70,000	- -	2,399,000
(3) Range manage- ment research ..	1,013,251	1,047,000	+33,000	- -	1,080,000
(4) Wildlife habi- tat research ...	363,749	524,000	+16,000	- -	540,000
(5) Forest recrea- tion research ..	299,193	401,000	+13,000	- -	414,000
Subtotal, Forest and range management research .....	9,655,813	10,449,000	+316,000	- -	10,765,000

(Continued on next page)

Project	1962	1963 (estimated)	Increase or Decrease		1964 (estimated)
			Increased	Other	
			Pay Costs (P.L. 87-793)		
b. <u>Forest protection research:</u>					
(1) Forest fire research .....	1,338,164:	1,505,000:	+42,000	- -	1,547,000
(2) Forest insect research .....	1,719,201:	1,784,000:	+60,000	- -	1,844,000
(3) Forest disease research .....	1,468,257:	1,581,000:	+54,000	- -	1,635,000
Subtotal, Forest protection research .....	4,525,622:	4,870,000:	+156,000	- -	5,026,000
c. <u>Forest products and engineering research:</u>					
(1) Forest products utilization research .....	4,208,050:	4,656,000:	+173,000	- -	4,829,000
(2) Forest engineering research .....	123,785:	214,000:	+7,000	- -	221,000
Subtotal, Forest and engineering research .....	4,331,835:	4,870,000:	+180,000	- -	5,050,000
d. <u>Forest resource economics research:</u>					
(1) Forest survey .....	1,597,152:	1,624,000:	+52,000	- -	1,676,000
(2) Forest products marketing research .....	517,385:	728,000:	+22,000	- -	750,000
(3) Forest economics research .....	468,541:	514,000:	+17,000	- -	531,000
Subtotal, Forest resource economics research .....	2,583,078:	2,866,000:	+91,000	- -	2,957,000
e. <u>Forest research construction</u> .....	5,097,892:	2,550,000:	- -	-2,550,000(3)	- -
Total, Forest Research .....	26,194,240:	25,605,000:	+743,000	-2,550,000	23,798,000
3. State and Private Forestry Cooperation:					
a. <u>Cooperation in forest fire control</u> .....	12,543,539:	12,491,000:	+23,500	- -	12,514,500
b. <u>Cooperation in forest tree planting</u> .....	299,705:	298,000:	+2,000	- -	300,000

(Continued on next page)

Project	1962	1963 (estimated)	Increase or Decrease		1964 (estimated)
			Increased Pay Costs (P.L. 87-793)	Other	
c. <u>Cooperation in forest management and processing</u> ..	2,465,284	2,509,000	+9,000	- -	2,518,000
d. <u>General forestry assistance</u> .....	416,707	580,000	+30,500	- -	610,500
Total, State and Private Forestry Cooperation .....	15,725,235	15,878,000	+65,000	- -	15,943,000
Total, Forest Protection and Utilization c/ ...	203,733,629	183,513,000	+3,693,000	+3,191,000	190,397,000
Unobligated balance lapsing .....	655,726	- -	- -	- -	- -
Total increased pay costs (P.L. 87-793):	(- -)	(3,810,000)	(3,771,000)	(+250,000)	(7,831,000)
Total available or estimate .....	204,389,355	183,513,000	+3,693,000(4)	+3,191,000	190,397,000
Transferred to "Operating expenses, Public Buildings Service, General Services Administration" ..	+278,645	+352,000			
Proposed supplemental for increased pay costs .....	- -	-3,800,000			
Total appropriation or estimate .....	204,668,000	180,065,000			

a/ Includes allocation to the Department of the Interior: 1963, \$360,700; 1964, \$379,400.

b/ Includes allocation to the Department of the Interior: 1963, \$404,500; 1964, \$601,000.

c/ Represents obligations. Applied costs for 1962 are \$194,091,065. The difference of \$9,642,564 reflects, primarily, contracts made and orders placed in 1962 over contractual services and equipment used in that year.

d/ Includes \$7,300 estimated to be transferred to "Salaries and expenses, General Administration," during fiscal year 1963 for the Office of the Inspector General.

### INCREASE OR DECREASE

The net increase of \$6,884,000 in the Forest Protection and Utilization appropriation consists of the following:

(1) An increase of \$5,250,000 in timber sale administration and management, would be used to increase the timber cut by 1.3 billion board feet to a total of 11.0 billion board feet and to increase the volume to be sold by 200 million board feet to a total of 12.0 billion board feet.

During the last year there has been intense pressure for National Forest timber sales at full allowable cut rates. The needs of the lumber industry for an expanded timber sale program and for the application of higher standards in the administration of the program were reviewed by the Senate Commerce Committee in a series of hearings in the Pacific Northwest and in Washington, D. C.

On July 26, 1962, President Kennedy announced an 8-point program designed to assist the lumber industry and improve its competitive position which included a directive to the Secretary of Agriculture for a report on interim increases in allowable cuts by October 15.

This request has resulted in increasing allowable cuts by about 547 million board feet or approximately 8% on the 42 western National Forests where demand for stumpage exceeds available supply. The planned increase for fiscal year 1964 in timber sold on these 42 National Forests to keep in step with these allowable cut increases will in part be offset by downward adjustment in sale programs in parts of the Rocky Mountain areas and Alaska where it is proving impossible to attain the level of sales previously planned under present cost-price relationships.

There is general agreement among the Administration, the concerned congressional delegations and industry spokesmen that an essential step in helping the lumber industry to maintain or improve its competitive position with Canadian lumber producers and other building products is to sell the maximum amounts of timber which can be made available with adherence to multiple-use and sustained-yield management on those National Forests where demand for timber exceeds available supply.

The competitive problems of the industry make even more pertinent the statement made to the House Appropriations Committee in 1959 during hearings on the 1960 Appropriation Bill:

"The Forest Service is by far the largest single supplier of raw material for the Nation's forest products industry. Many mills, both large and small, are primarily or wholly dependent on continuing or increasing purchases of National Forest timber. Alternate sources of purchase of timber for major segments of the lumber and plywood industry in the Pacific Northwest have now been exhausted. This almost complete dependence on purchase of National Forest timber for continued operation makes the conduct of the National Forest timber sales program more significant than ever. Sale of timber at the maximum feasible rate within sustained-yield cutting limitations is an indispensable link in maintaining employment, payrolls, community

stability, and an adequate supply of lumber and plywood for National consumptive needs.

"Many mills must purchase timber to keep operating. The National Forests are the one place where they can buy it. The job of selling it must be done by the Forest Service. This will keep mills going, provide jobs, and stimulate the general economy."

Summary of total program proposed for fiscal year 1964:

Sale preparation: 12.0 billion bd. ft. at \$0.60 per M ...	\$7,200,000
Sale administration: 11.0 billion bd. ft. at \$1.65 per M	18,150,000
Advance sale preparation: 3.0 billion bd. ft. at \$0.30	
per M .....	900,000
Timber inventories and management plans .....	1,750,000
Pay Act costs .....	1,600,000
Total .....	<u>29,600,000</u>

The sell and cut estimates include 700 million board feet in special small and salvage sales.

(2) An increase of \$491,000 as required for mandatory payments to the Employees Compensation Fund in accordance with Public Law 86-767 (5 U.S.C. 785), which was enacted September 13, 1960, for benefit payments made from that fund to employees of the Forest Service who are injured while in the performance of duty. A total of \$520,000 was paid to Forest Service employees during the fiscal year 1962.

(3) A decrease of \$2,550,000 for forest research construction. No major research facility construction is included in the budget request. This reduction results from the following nonrecurring items included in the 1963 appropriation:

Alexandria, Louisiana .....	\$450,000
Athens, Georgia .....	250,000
Bluefield-Princeton, West Virginia .....	150,000
Corvallis, Oregon .....	80,000
Delaware, Ohio .....	64,000
Logan, Utah .....	300,000
Madison, Wisconsin (architectural and engineering planning) .....	200,000
Olustee, Florida .....	35,000
Parsons, West Virginia .....	150,000
Research Triangle, (Raleigh-Durham) North Carolina .....	126,000
Stoneville, Mississippi .....	45,000
Tempe, Arizona .....	450,000
Warren, Pennsylvania .....	<u>250,000</u>
Total .....	<u>2,550,000</u>

(4) An increase of \$3,693,000 for pay costs pursuant to P.L. 87-793 consisting of \$1,554,000 to provide for full year costs of the first step of the pay increase pursuant to P.L. 87-793 and \$2,139,000 for fiscal year 1964 cost of the additional increase effective January 5, 1964.

Method of computing pay act costs

1. Costs for 18-1/2 pay periods (October 14, 1962 through June 30, 1963) were computed on a local basis by individual regional and experiment station offices and for the Washington office, using the following guidelines:
  - (a) Analysis of the actual cost of pay act salaries for all employees paid at classified rates on the basis of operating budgets which were prepared in accordance with the Appropriation Act for fiscal year 1963.
  - (b) Adjust costs developed in (a) above to a net figure by allowing for savings resulting from lapses (delays in filling vacant positions, leave without pay, lag in recruitment for new positions), from filling vacancies at lower rates of pay or from temporary employment for only part of the year; and to offset such savings by anticipated terminal leave payments.
  - (c) Addition of related increased personnel benefit costs such as the Government's contribution for retirement, employees' old age and survivors' insurance, employees' life insurance, and increased costs for payments to other agencies or revolving funds such as the Working Capital Fund where increased salary costs will be reflected in the charge for services or materials so obtained.
2. Total pay act cost for 18.5 pay periods as developed above was then utilized to determine the equivalent cost for a full 26 pay periods.
3. By sample calculations of total Service-wide grades and salaries, a weighted factor was developed for the January 1964 increase based upon averaging increases for each grade, taking into consideration the number of employees in each grade and the number of ungraded positions. This was then used to adjust the full-year pay act cost developed in 2 above to determine the full amount of such costs applicable to fiscal year 1964.

An analysis of increased pay requirements on the base for 1964 is shown in the following tabulation. (Pay costs related to increases requested for 1964 are included as a part of such increases.)

Full-year costs of first step of pay increase .....	\$5,354,000
Additional amount required for second step of pay increase effective January 5, 1964 .....	<u>2,139,000</u>
Total pay costs, fiscal year 1964, for personnel on hand in 1963 .....	7,493,000
Deduct anticipated supplemental, fiscal year 1963, to cover 18.5 pay periods in 1963 .....	-3,800,000
Additional amount required, fiscal year 1964 .....	<u><u>3,693,000</u></u>

This increase is necessary because the 1964 budget request contemplates continuation of all programs financed from this appropriation at the 1963 program levels except for the increase for timber sales administration and management as reflected in the project statement. Failure to provide for this additional cost would seriously curtail these programs.

\* \* \* \* \*

The following table reflects the status of financing the Development Program for the National Forests during the fiscal year 1963:

FINANCING OF DEVELOPMENT PROGRAM FOR THE NATIONAL FORESTS, FISCAL YEAR 1963

	1963 Planned Level	1963 Appropriation: Act	Difference	Percent Financed
FOREST LAND MANAGEMENT:				
National forest protection and management:				
Timber resource management:				
(a) Sales administration and management .....	\$24,188,000:	\$23,000,000:	-\$1,188,000:	95.1
(b) Reforestation and stand improvement .....	17,626,000:	15,130,000:	-2,496,000:	85.8
Subtotal, Timber resource management ..	41,814,000:	38,130,000:	-3,684,000:	91.2
Recreation-public use ....	30,437,000:	25,920,000:	-4,517,000:	85.2
Wildlife habitat management:	3,684,000:	3,400,000:	-284,000:	92.3
Range resource management:				
(a) Management .....	4,628,000:	4,680,000:	52,000:	101.1
(b) Revegetation .....	2,666,000:	2,640,000:	-26,000:	99.0
(c) Improvements (includ- ing Cooperative Range Improvements) .....	3,355,000:	3,160,000:	-195,000:	94.2
Subtotal, Range resource management ..	10,649,000:	10,480,000:	-169,000:	98.4
Soil and water management	174,926,000:	174,460,000:	-466,000:	90.5
Mineral claims, leases, and other land uses .....	7,736,000:	7,140,000:	-596,000:	92.3
Forest fire protection ...	22,287,000:	21,600,000:	-687,000:	96.9
Structural improvements for fire and general purposes .....	12,961,000:	12,050,000:	-911,000:	93.0
Rehabilitation of burns ..	1,050,000:	1,050,000:	- -	100.0
Total, National forest protection and management .	135,544,000:	124,230,000:	-11,314,000:	91.7
Insect and disease control:				
White pine blister rust control .....	2,564,000:	2,411,000:	-153,000:	94.0
Other pest control .....	5,239,000:	5,759,000:	520,000:	109.9
Total, Insect and disease control .....	27,803,000:	27,817,000:	367,000:	104.7
Purchase of lands .....	31,905,000:	500,000:	-1,405,000:	26.2
TOTAL, FOREST LAND MANAGEMENT	145,252,000:	132,900,000:	-12,352,000:	91.5

(Continued on next page)

FINANCING OF DEVELOPMENT PROGRAM FOR THE NATIONAL FORESTS, FISCAL YEAR 1963  
(contd.)

	1963 Planned Level	1963 Appropriation: Act	Difference	Percent Financed
FOREST ROADS AND TRAILS, including "Roads and Trails for States" (10% fund) .....		58,400,000		
ACCESS ROADS .....		2,000,000		
TOTAL ROAD PROGRAM .....	75,170,000	60,400,000	-14,770,000	80.4
ACQUISITION OF LANDS, SPECIAL ACTS .....	30,000	30,000	- -	100.0
ACQUISITION OF LANDS, SUPERIOR NATIONAL FOREST ...	2,000,000	2,000,000	- -	100.0
TOTAL, SPECIAL ACQUISITION ..	2,030,000	2,030,000	- -	100.0
TOTAL, DEVELOPMENT PROGRAM FOR THE NATIONAL FORESTS, 1963 .....	222,452,000	195,330,000	-27,122,000	87.8

1/ Amounts reduced by \$1,050,000 for line item "Rehabilitation of burns".

2/ Excludes \$2,200,000 for lands not administered by the Forest Service.

3/ Amount reduced by \$30,000 for special acquisition.

Fiscal Year 1963 Accelerated Public Works Program

In addition to the foregoing appropriations shown for 1963, allocations to the Forest Service under provision of the Accelerated Public Works Act are providing further for meeting the planned objectives of Forest Service programs. Accelerated Public Works projects conducted by the Forest Service have given many economically distressed areas substantial and needed assistance. Thousands of unemployed residents of these communities benefited from immediate employment on work projects conducted either by the Forest Service or by contractors performing work for the Forest Service. In addition to this current economic benefit, the reforestation, timber stand improvement, recreational facility development, range and wildlife improvements, road construction, etc., will contribute permanent economic benefits to these areas.

A total of \$27 million has been allocated to the Forest Service through January 15, 1963. The initial allocation of \$15 million of Accelerated Public Works financing is being used for the following purposes:

<u>Activity</u>	<u>Estimated Cost</u>
Construction:	
Roads and trails .....	\$4,400,000
Recreation and administrative facilities .....	6,600,000
Research facilities (greenhouses, storage buildings, etc.) .....	450,000
Maintenance of improvements .....	950,000
Land treatment (reforestation, timber stand improvement, erosion control, insect control, etc.) .....	2,600,000

An additional allocation of \$12,000,000 received in January, 1963 includes \$10,000,000 which will be similarly utilized and \$2,000,000 for grants to states in connection with State and Private Forestry programs. As a result of these allocations, the Development Program will be generally on schedule in total by the end of fiscal year 1963.

However, the Accelerated Public Works Program creates a situation of not being able to move forward with a balanced national program as over half of the National Forest land is not within eligible areas. Regular programs must continue to move forward in these critical areas in 1964 or the overall effect could be worse locally than if the Public Works allocations had not been made. Geographically, project accomplishments in 1963 will vary widely, and program financing and accomplishments will be considerably below the originally planned 1963 levels for the non-qualifying areas.



STATUS OF PROGRAM

FOREST LAND MANAGEMENT

National Forest Protection and Management

Current Activities: The purpose of this program is to manage, protect, and develop the national forests and national grasslands under multiple use and for sustained yield. Under these principles natural resources of outdoor recreation, range, timber, watershed, and wildlife are utilized in a planned combination that will best meet the needs of the Nation without impairing productivity of the land. These management and utilization principles were recognized in the Multiple Use-Sustained Yield Act of June 12, 1960 (Public Law 86-517, 74 Stat. 215).

Under the multiple-use principles practically all areas are used for, or serve, more than one purpose or objective. For example, about 50% of the area within the national forests of the continental United States serves five different purposes: (1) timber production, (2) watershed protection, (3) forage production, (4) wildlife production, and (5) recreation. An additional 28% serves four purposes in varying combinations. Of the remainder, 21% of the total serves three purposes with only one percent of the total reserved exclusively for a single purpose, mainly campgrounds and special use areas, such as summer homesites, pastures, corrals, etc.

The varied interests which frequently conflict and which must be reconciled, the vast areas covered, and the unusual complexities clearly require careful planning and skillful management of the national forest properties.

Gross area within unit boundaries encompasses about 226 million acres in 44 States and Puerto Rico, of which some 186.2 million acres are under Forest Service administration. Protection from fire and trespass is made difficult by the large area to be protected, the general inaccessibility, the many thousands of miles of exterior boundary, the intermingled public and private land ownership patterns, the impossibility of taking preventive action with such a problem as lightning-caused fires, and the rapidly increasing public utilization of these lands and their associated resources.

The economic importance of the national forests and national grasslands is evident when it is considered that:

- a. They produced a cash income in the fiscal year 1962 of over \$114 million. Approximately 65% of this amount is credited to the general fund in the Federal Treasury (miscellaneous receipts). The remainder is distributed in accordance with special acts of Congress, including 25% to the States or counties in which lands are located, and 10% made available for construction and maintenance of the Forest Service system of roads and trails. In addition to these cash receipts,

year market conditions showed some improvement. The following table shows progress made during the last five years in meeting the sustained-yield allowable cut objectives:

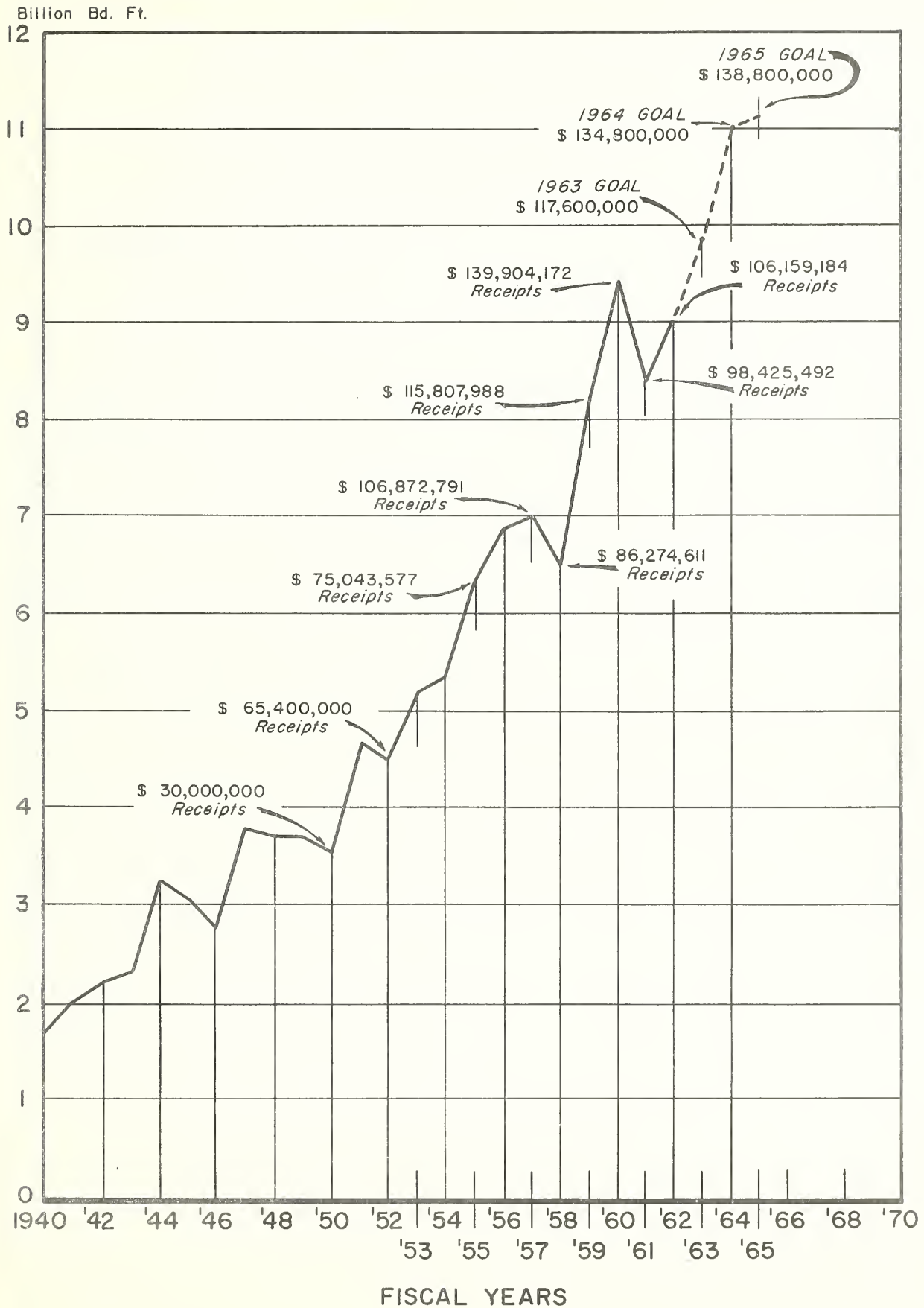
Volume in Billions of Board Feet					
Fiscal Year	: Annual	Percent of		Percent of	
	: Allowable	Actual	Allowable Cut	Actual	Allowable
	: Cut*	Cut	Harvested	Sold	Cut Sold
1958	9.9	6.4	65	13.3	134
1959	10.2	8.3	81	9.4	92
1960	10.4	9.4	90	12.2	117
1961	11.0	8.4	76	8.9	81
1962	11.2	9.0	81	10.3	92
1963	12.6				

\* As of January 1 preceding start of the fiscal year. This is the basis for program planning.

Timber inventories and management plans are designed to organize each major management unit (working circle) into an array of timber stand ages and conditions which will insure continuous and relatively uniform annual production of commercially valuable timber without damage to soil, waterflow, and other forest resources and uses. Each management plan is revised at approximately decade intervals.

The national forests presently contain 94,885,000 acres of unreserved commercial forest land divided into 364 working circles for the purpose of long-range planning and management. New plans were approved for 73 working circles in fiscal year 1962. These new plans, plus some interim adjustments in cutting rates, have resulted in an allowable annual cut increase from 11.2 to 12.6 billion board feet, of which 10.4 is in trees of sawtimber size. The remaining volume (424.5 million cubic feet) is in trees below sawtimber size or grade which are suitable only for other timber products such as pulpwood.

# VOLUME NATIONAL FOREST TIMBER CUT







A typical logging operation on a western National Forest.





This overmature pine is being marked for cutting. Its removal will release the young stand already forming beneath it.



Log accountability is important on National Forest sales. These assembled logs are being "scaled" by Forest Officers to determine board foot volume as a basis for payment by the purchaser.





### Reforestation

Planting trees by hand on an area of high quality forest land burned over by forest fire. Steep slopes, big snags and broken trees preclude the use of machines. Heavy cover of weeds and brush precludes direct seeding. This condition is typical of much area needing reforestation in the West.



Expansion of nursery operations is necessary to supply the planting stock that will be required for the reforestation program.



Irrigation systems are designed to water large areas at one time for efficient low cost operation.



Chemical weed control is one of many cost saving practices used in tree nurseries. Surface sprays and soil treatments have replaced costly hand weeding saving hundreds of thousands of dollars in tree production costs.





This stagnated stand of pine is badly in need of thinning.



Timber stand improvement funds are used to thin and prune the stand to obtain maximum growth and timber quality.



### Reforestation and Timber Stand Improvement

Reforestation accomplishment in fiscal year 1962 substantially increased over fiscal year 1961, exceeding (or closely approaching) the peak record set by the conservation programs in 1936. Fifteen Forest Service nurseries produced 147.2 million trees. Several of the operating nurseries were enlarged and construction was started on two new ones.

Major reforestation and timber stand improvement accomplishments in fiscal year 1962 are shown in the following table:

	Acres Treated		Fiscal Year 1962 Total
	Financed under Forest Land Management Appropriation	Financed with Deposits from Timber Sales <sup>1/</sup>	
Planted or seeded .....	110,370	87,422	197,792
Measures to obtain natural regeneration (scarifying, burning) .....	31,961	24,590	56,551
Release, weeding, thinning, and cull tree treatment ...	146,216	236,403	382,619
Pruning .....	4,515	29,195	33,710

<sup>1/</sup> Funds collected from timber sale operators under the Knutson-Vandenberg Act of June 9, 1930 (16 U.S.C. 576b).

Substantial progress was made on the forest tree improvement program by establishing seed production areas and seed orchards and developing hybrid trees. Measures were also taken on approximately 750,000 acres to protect reproduction from damage by domestic stock, rodents and game animals.

## Recreation-Public Use

The National Forests received 3-3/4 times as many visits for recreation in calendar year 1961 as in 1950. Twenty million visits were made for picnicking, 16 million for fishing, 8.5 million for hunting, 6.9 million for camping, and 4.4 million for skiing and other winter sports. The rest were for swimming, hiking, riding, or just to enjoy forest environment. In all, there were 101,912,000 visits in 1961 not counting those who simply drove through and enjoyed the scenery.

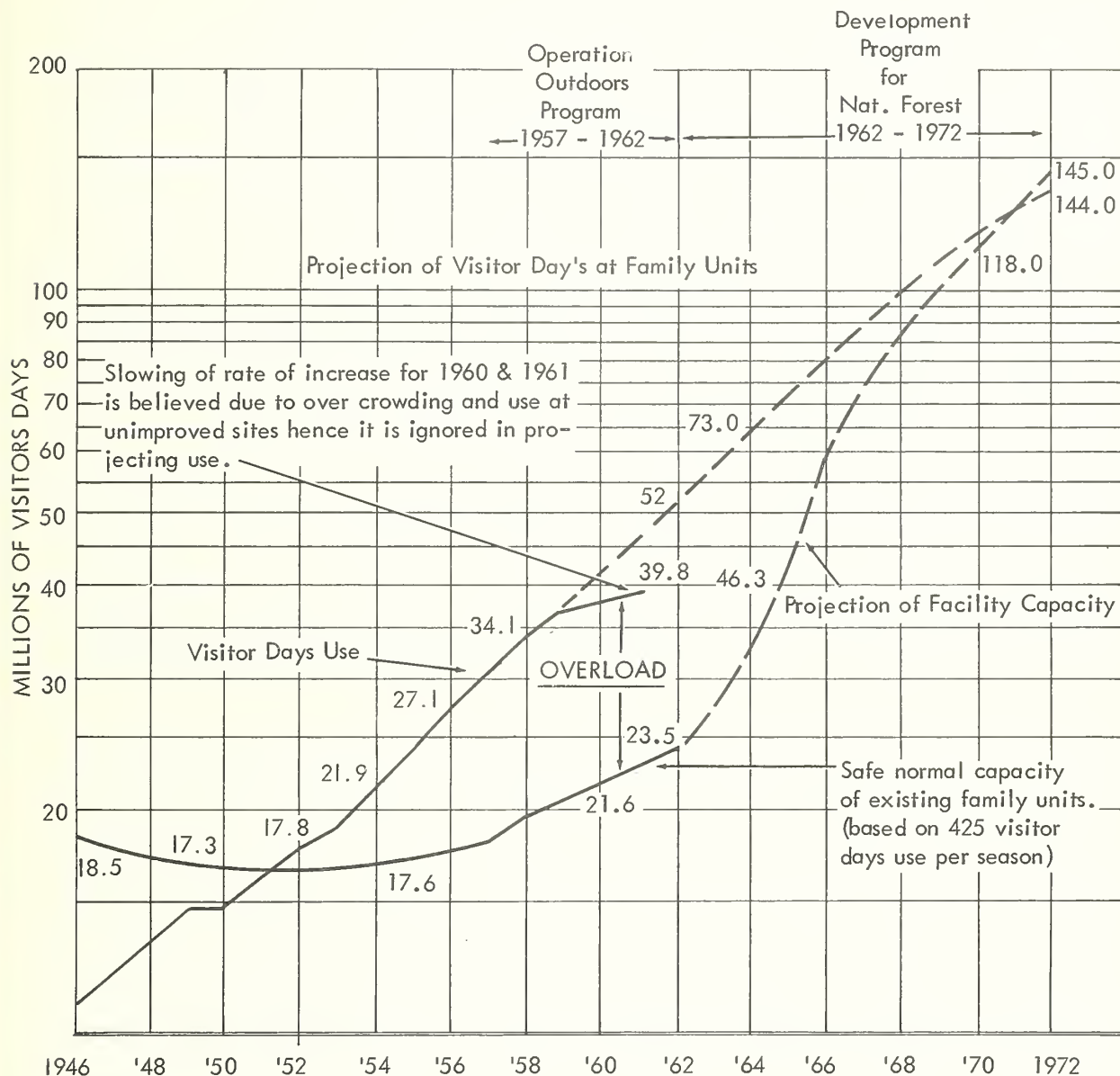
The record indicates that the strong growth trend in this important National Forest activity will continue:

<u>Calendar year</u>	<u>Recreation visits to the National Forests</u>	<u>Percentage increase over 1950</u>
1950	27,368,000	
1952	33,007,000	21
1954	40,304,000	47
1956	52,556,000	92
1958	68,449,000	150
1960	92,594,000	238
1961	101,912,000	273
1962 (Est.)	115,000,000	319

As of June 30, 1962, there were 59,003 family units at National Forest camp and picnic sites, of which 18,600 were still in need of rehabilitation. The fiscal year 1963 appropriation provided funds for rehabilitation of an estimated 9,660 such units leaving approximately 8,940 yet to be reworked. In addition, 17,050 new family units have been added since the Operation Outdoors Program started in fiscal year 1958. An additional 5,484 are programmed for construction during fiscal year 1963. Since fiscal year 1958, 172 other types of recreational facilities, such as swimming, boating, and winter sports sites, have been rehabilitated and 170 have been constructed or expanded. One hundred sixty-four such facilities are to be rehabilitated and 30 additional facilities are to be constructed in fiscal year 1963.

Existing recreation facilities are now being used 70% above their safe capacity. The most acute situations exist where new developments such as reservoirs and highways have brought crowds of recreation seekers to locations where no previous recreation use or facilities existed.

# Relationship of Safe Capacity of Family Units at Camp and Picnic Sites to Actual and Projected Use

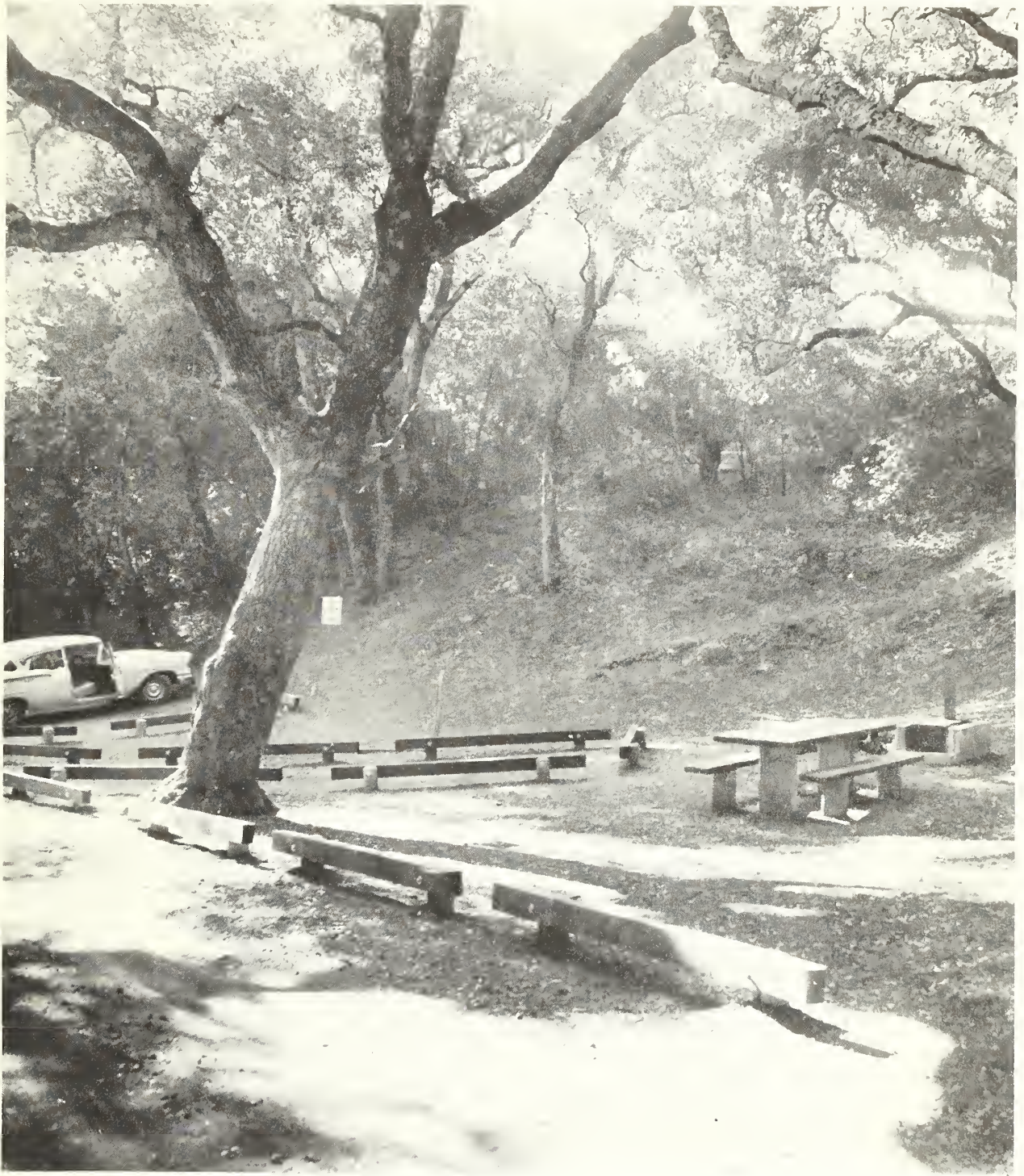






102 million people visited the National Forests during calendar year 1961 to enjoy these recreation resources and facilities.





Typical Campground Family Unit



Example of Visitor Information Services



Nature Trail - Ocala National Forest



Interpreting Geology at Earthquake Area - Gallatin National Forest



A survey of recreation resources has been completed which consisted of a field inventory and evaluation of existing and potential recreation sites in areas suitable and available for the many public recreation uses of the National Forests. The inventory and evaluation of National Forest recreation resources will now be used to prepare adequate recreation management plans for each National Forest.

The Visitor Information Service is now in its second year. Many recreation visitors have taken advantage of the program to learn more about forest land management, geology, natural history, and history of the forests they visit. They may learn through self-guided trails and auto tours, signs, exhibits, information centers, visitor centers, and personal contact with the forest naturalists who give campfire programs and conduct walks. Additional facilities are being planned and installed during fiscal year 1963 to meet the growing need for informational services of this nature.

### Wildlife Habitat Management

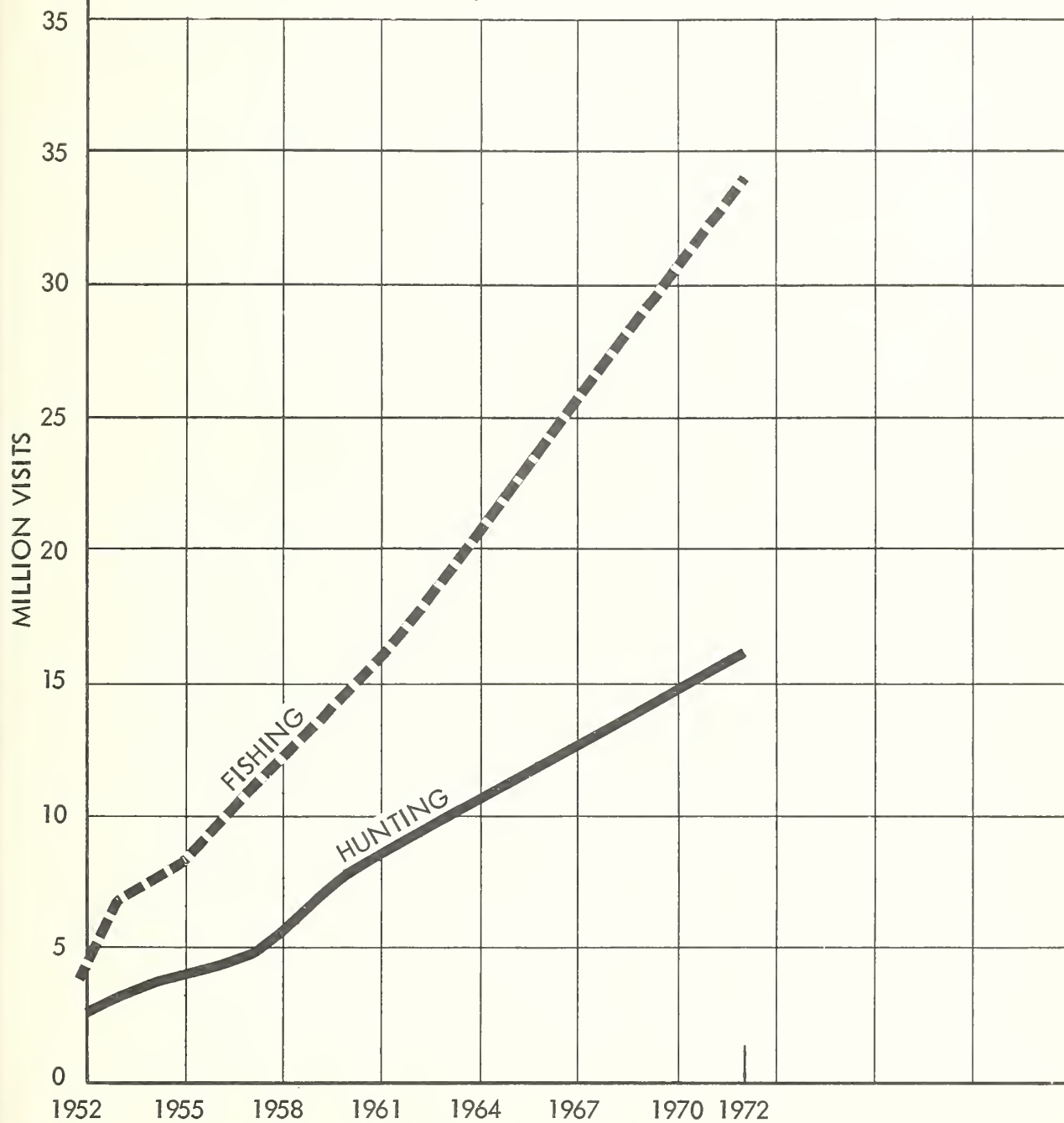
During the past year, hunters and fishermen made 2-1/2 million more visits to the National Forests and National Grasslands than in 1960. This amounts to approximately a 10-percent rise in forest usage by sportsmen.

Intensified training was given to Forest Service personnel to insure adequate multiple use coordination of the maintenance and development of wildlife habitat. Close coordination and cooperation were maintained with State fish and game departments who are responsible for the promulgation and enforcement of game management regulations. Forest Service activities are directed toward the development of wildlife habitat necessary to supply adequate food, water, and cover on National Forest lands. State conservation agencies often also provide material assistance in habitat improvement projects on lands administered by the Forest Service.

Habitat improvement accomplishments on National Forests in fiscal year 1962 were:

Permanent wildlife openings	3,285 acres
Prescribed burns	34,210 acres
Revegetation of key wildlife areas	24,880 acres
Small water developments	486
Fencing key areas	6,800 acres
Stream improvements	150 miles
Lake improvements	140 acres
Fishing lakes	190 acres
Waterfowl lakes	330 acres
Access roads and trails	250 miles

National Forest  
Hunting and Fishing Visits  
1952-1961  
(Projected to 1972)







Range lacks the deer food needed for more wildlife.



Game Range can be improved to carry more deer, and satisfy more hunter use.





Wildlife habitat improvements such as this pond provide needed water for deer, turkeys, and other large and small game.





This stream lacks the pools for optimum trout production.



Stream improvements create the desired ratio of pools to riffles.



# Range Resource Management

During calendar year 1961, the following numbers of livestock were permitted to graze on the National Forests, National Grasslands, and Land Utilization Projects:

	<u>Number</u>	<u>Animal Months</u>
Cattle, horses, and swine	1,293,113	6,552,398
Sheep and goats	2,491,259	6,963,359

Permits are issued for adult animals only. The offspring of permitted animals under six months of age are allowed to graze without additional charge. The total number of domestic animals, permitted stock plus the offspring, is about six million. In addition to the 40,084 permits covering the grazing of livestock under paid and free permits, 896 cross-ing permits were granted, and 2,184 permits were issued for grazing on private land waived to the Government for joint management with Government land.

Grazing receipts from lands administered by the Forest Service the past two fiscal years were:

	<u>1961</u>	<u>1962</u>
National Forests .....	\$3,268,037	\$3,195,422
National Grasslands and Land		
Utilization Projects .....	630,460	609,864
Total .....	<u>3,898,497</u>	<u>3,805,286</u>

Grazing fees are established annually using a formula based upon the average price per hundred pounds for beef and lambs received by the producers in the western States. The average annual animal month grazing fees for the past two years were:

	<u>Cattle</u>	<u>Sheep</u>
1961	\$0.46	\$0.0875
1962	0.46	0.0775

In cooperation with the Pacific Southwest Forest and Range Experiment Station, the rest-rotation management system was initiated in Regions 1, 2, 4, 6, and 9. A start was made in establishing at least one rest-rotation demonstration allotment in each of these regions.

New agreements replacing those which expired in 1961 on the National Grasslands and Land Utilization Projects have been reviewed and modified as necessary to make them consistent with National Forest management regulations and policies. A workload analysis was completed to determine the needs for bringing "unregulated" livestock use in Region 8 under proper administrative control. Funds have now been programed to begin this work and such allotments will be increased as necessary as the work progresses.

The Secretaries of the Interior and Agriculture were directed by the Senate Appropriations Committee to initiate a trial program of public land range appraisal during fiscal year 1962. This program was conducted jointly by the Forest Service for Agriculture and the Bureau of Land Management for the Interior. The report on the trial program and a prospectus for a nationwide public land range appraisal were submitted to the Senate Committee in July 1962.

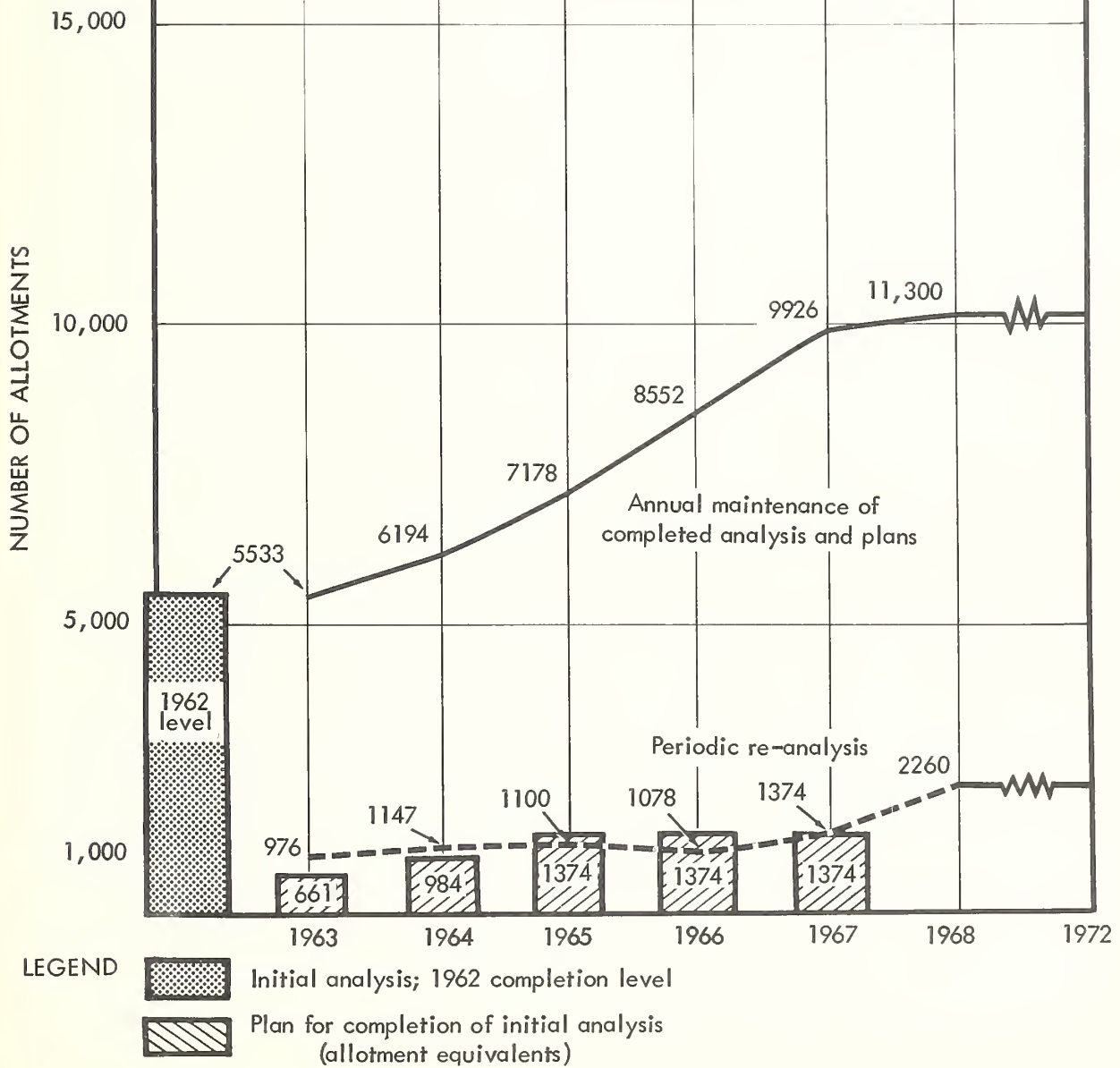
Work on inventory and development of management plans continued for the 11,306 grazing allotments administered by the Forest Service. During fiscal year 1962, a total of 696 allotment equivalents of work was accomplished to bring this task to 49 percent of completion. The following chart shows the present status and program goals, and illustrates the recurring phases of the analysis task. Training in analysis problems, standards and management procedures was continued to insure proper standardization among all Forest Service regions for this range analysis work.



Livestock grazing is an integral and important part of the Multiple Use Management of the National Forests.



# Range Allotment Analysis and Management Planning is a Continuing Job







Reseeded and fenced ranges restore such lands so that they can be properly managed and help to stabilize the livestock industry by providing quality forage and controlled rest-rotation management on National Forest range-lands.





Water developments assist in providing for the controlled distribution of livestock grazing of the National Forest rangelands.



### Range Revegetation

During fiscal year 1962, the following range revegetation and noxious farm weed accomplishments were achieved by use of Federal funds, and cooperative deposits and other contributions by forest range users:

	<u>Acres</u>
Revegetation seeding	50,699
Plant control (seeded)	47,444
Plant control (not seeded)	<u>100,354</u>
Total revegetation	198,497
Poison plant control	630
Noxious farm weed control	4,529
Rodent control	16,051
Water spreading	7,647

Field testing continued on various pieces of new equipment suitable for use in the range rehabilitation program to facilitate accomplishment of this work with the greatest efficiency and economy.

### Range Improvements

During fiscal year 1962, the following range improvements were constructed:

	<u>Government Funds</u>	<u>Cooperation with Permittees</u>	<u>Total</u>
Fences (miles)	1,506	282	1,788
Cattleguards (each)	264	34	298
Stock Driveways	70	40	110
Corrals	10	20	30
Water developments	1,293	510	1,803

Approximately 20 percent of the funds allocated were expended for maintenance of existing range improvements.

## Watershed Management

### Soil and water management

Impact surveys - Some of the most desirable remaining reservoir sites for flood control, hydro power, irrigation, recreation, industrial and municipal purposes are located within the National Forests. Each year an increasing number of these sites are being selected for development. They usually have both beneficial and adverse effects on National Forest multiple-use opportunities, and so require thorough field investigations to determine how individual projects can best enhance such use. During fiscal year 1962, impact surveys of this type were completed on 29 projects and work was underway on an additional 35.

Hydrologic surveys - In Utah detailed hydrologic surveys of specific sub-drainages classified existing and potential flood source areas which were the basis for establishing proper land use on range-watershed areas. In these cases watershed specialists identified impaired watershed conditions and determined the effect of past, present and future grazing use on soil stability, hydrologic conditions, erosion and sediment potential, and site productivity. In Idaho and Montana goals for obtaining water inventory information on barometer watersheds to guide multiple-use management were being met. As of June 30, 1962, 141 crest gages had been installed on sixteen forests.

Soil surveys - Field surveying of soils on National Forests moved ahead in all Regions with available information being applied in Ranger District multiple-use planning and in current management. The value of soils information is illustrated on the Umpqua Forest in Oregon where cutbank stability classes and erosion potentials for various degrees of topography were delineated to enable location of access roads and timber sale areas in watersheds which would otherwise be unavailable for timber harvest.

Watershed rehabilitation - Some progress was made in reducing the backlog of restoration work needed on forest and range lands. At the same time first aid measures were applied toward rehabilitation work on all recently burned-over areas where serious watershed deterioration or loss of site productivity was likely to occur. During the year over 100,000 acres of deteriorated watersheds administered by the Forest Service and nearly 1,000 miles of eroding stream channels and old roads were treated for watershed improvement purposes on 122 National Forests and Grasslands.



This mountain meadow has been seriously damaged by erosion. Gulley control check dams are being installed to prevent further erosion to restore the meadow's productivity and to eliminate further down stream damage.



Erosion has been stopped and vegetative cover has been restored.





This burned over timber area has received emergency burn rehabilitation treatment to retard soil and water damage. Contour trenches have been installed to minimize erosion loss until the area can be replanted and restored to full resource productivity.



Evaluation of watershed management practices - In the Intermountain Region the effects of contour terracing on soil stability and reduced overland flow of water received a timely test in July and August 1962. Rainstorms of moderate to high intensity occurred on the Fishlake National Forest in the vicinity of the Meadow Creek and Chalk Creek drainages. Records indicate that the storms were of equal intensity and duration in both drainages. The affected portion of Chalk Creek drainage is in a badly depleted condition and no watershed treatment measures had been applied. In this drainage overland flows of water severely gullied the watershed, caused a high flow of water in stream channels, scoured stream banks and bottoms, and deposited many acre-feet of sediment and rocks in the residential section of Fillmore, Utah. The flood waters damaged five forest campgrounds, destroyed one mile of forest road and eliminated the fishery value of several miles of stream. Also impaired was the water source for the town of Fillmore, necessitating the expenditure of several thousands of dollars. In contrast, the surface runoff of the contiguous Meadow Creek drainage which was treated in 1956 by constructing contour terraces was contained on the site and gradually reached the main stream with no apparent land or channel erosion.

On the San Isabel National Forest, Colorado, a 5-year analysis of stream-flow characteristics from both treated and untreated watersheds showed the beneficial results of watershed restoration. Among other things base flows in terms of c.f.s. per square mile have been increasing each year since treatment. At the same time flood flows have been controlled and the natural habitat for fish and waterfowl is gradually being restored.

Water yield modification - In Arizona substantial progress was made on all phases of the 275,000 acre Beaver Creek pilot watershed on the Coconino National Forest. Here land management practices such as juniper control, grass seeding, timber stand improvement, various degrees of pine thinning, clear cutting, and prescribed burning, are applied in line with research findings, to determine effect on water yield and other resource values. Economic evaluations, inventories of water, soil, timber, forage, and recreation resources are being made on 20 various sized watersheds. The economic evaluations are being supported by careful measurement of precipitation, water yield, timber harvest, forage use by livestock and big game, and recreation use. Major accomplishments to date include the installation of 20 stream gages, three weather stations, 41 precipitation gages, 12,943 acres of juniper control, 12,840 acres of grass seeding, 192 acres of pine conversion, 17,471 acres of timber thinned, and 51 miles of access roads.

# Mineral Claims, Leases, and Special Uses

Mining Claims - The determination of surface rights of mining claims under the Act of July 23, 1955 (P.L. 84-167) continues to be a major activity. Following is a summary of progress to June 30, 1962:

Item	Number of areas	Acres	Estimated number of mining claims
Surface right determination to be done (revised estimate) ...	969	142,247,954	1,106,793
Field examination during 1962 ..	142	28,747,104	94,606
Total field examinations completed .....	884	131,902,076	1,090,226
150-day publication period expired .....	776	111,515,883	1,104,725
Determination job complete .....	457	65,751,804	494,189

As a result of determination of surface right procedure there are now 19,583 mining claims on which the claimants have asserted the validity of their surface rights. These claims are now being examined by the technical mineral examiners to determine their validity. That means that on about 112,000,000 acres of National Forest land which included an estimated one million mining claims the United States now has the right to manage the surface on all but 19,583 claims, and some of those may be resolved in favor of the United States.

Mineral permits and leases---The Secretary of Agriculture has the authority to dispose of common varieties of mineral materials on all lands under his jurisdiction. Permits and leases for oil and gas, coal, oil shale, potassium, sodium, phosphate, and sulfur on both public domain and acquired National Forest and National Grasslands and for hard rock minerals on acquired lands continue to be issued by the Bureau of Land Management, Department of the Interior, with the advice or consent of the Forest Service. The Forest Service supervises the land management protection, restoration, and rehabilitation provisions of all such leases and permits. The volume of mineral leases on land reserved from the public domain is steadily increasing. In 1961, 14,696,341 acres were under lease. The receipts from these leases are not credited as National Forest receipts, but are collected by the Department of the Interior and distributed to the reclamation fund, to States in which the lands are located, and to the Treasury as prescribed in applicable legislation. Forest Service fiscal year 1962 mineral receipts were \$1,507,779 for approximately 3,600,000 acres of acquired lands under permit or lease.

Development of properties under lease and new properties requires increased supervision. Strip mining creates difficult land use and protection problems. Road construction, location of improvements, construction of dams and reservoirs, protection of soil, water, and other surface resources, and fire protection require continued vigilance.

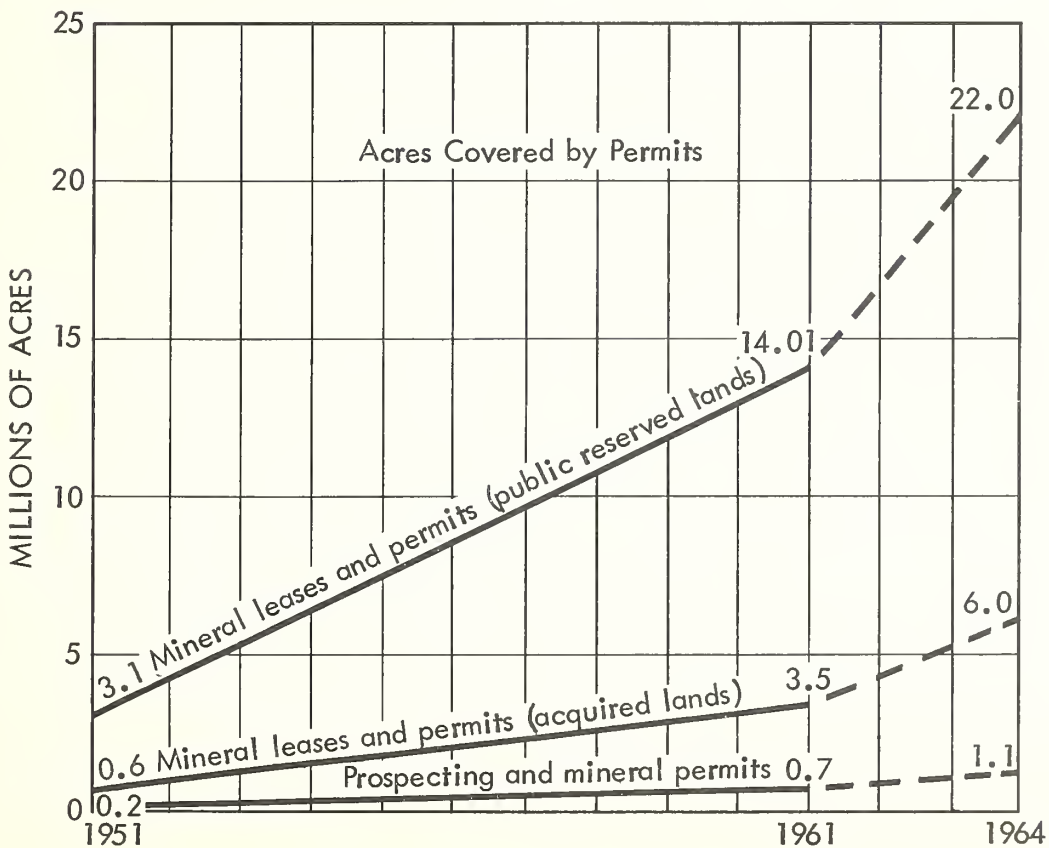
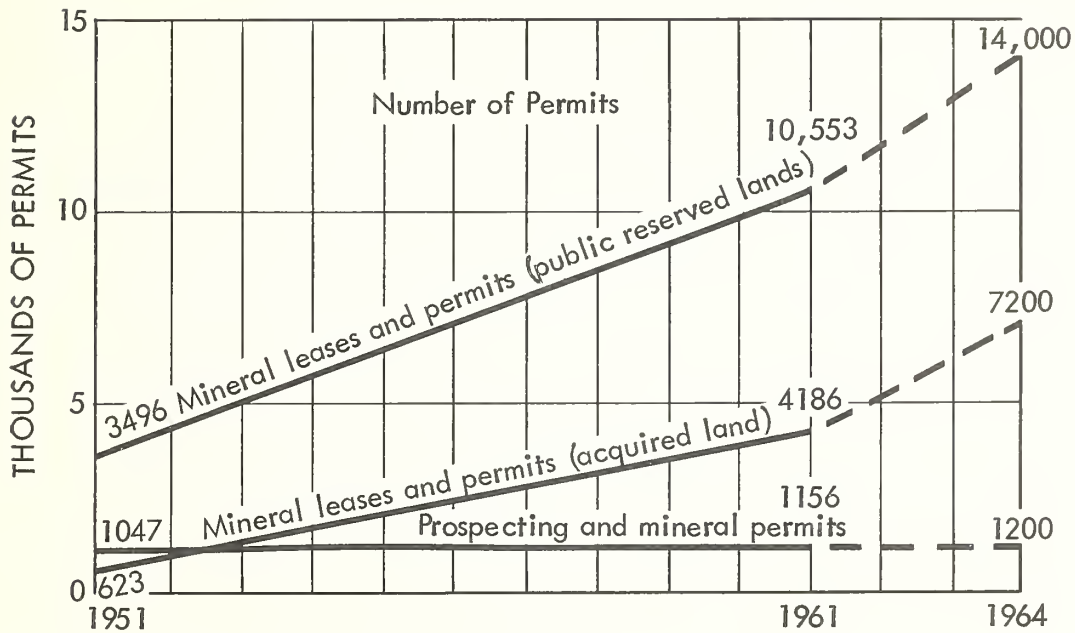


### OCCUPANCY USE OR ABUSE ?

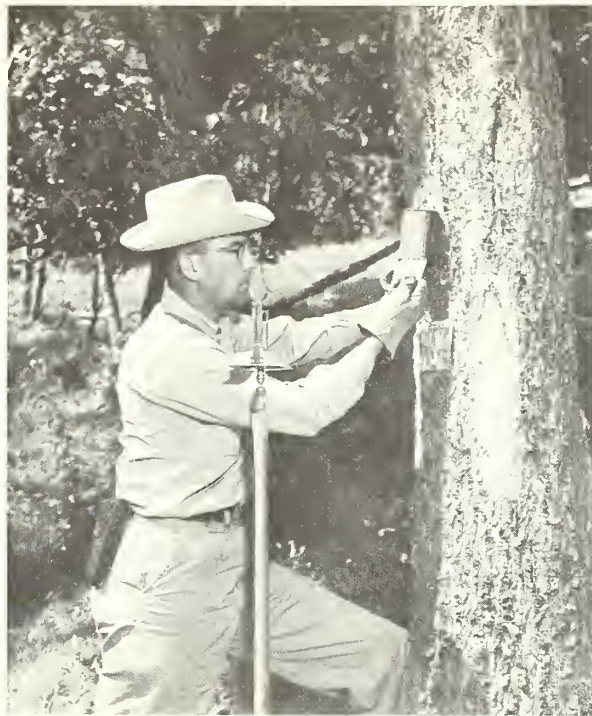
This building is located on an unpatented mining claim. The claim is being held primarily for residence purposes. Such illegal occupancy greatly complicates proper management of these National Forest lands and presents a serious fire hazard that could result in the destruction of thousands of acres of vital national resources.



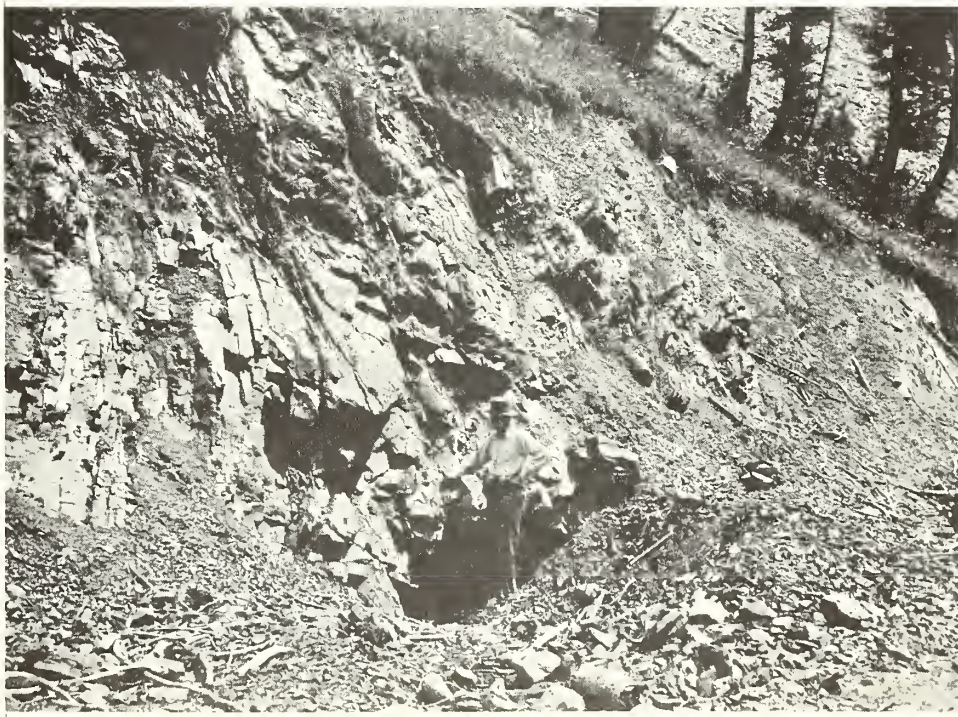
# The Mineral Leasing Activity Increased Sharply From 1951 to 1961 and an Even Greater Impact is Anticipated for 1964







Mineral claims must be promptly examined and reported on for patent approval or for elimination of illegal occupancy.



Typical unpatented claim. This claim for years prevented the sale of timber from the National Forest lands involved.



Proper Treatment of Strip Mined Areas will Restore Damaged or Destroyed Resources and Can Promote Improved Land Utilization.



Strip mined area about 5 years after mining coal. Note lack of vegetative growth on soil of low fertility exposed by stripping operation.

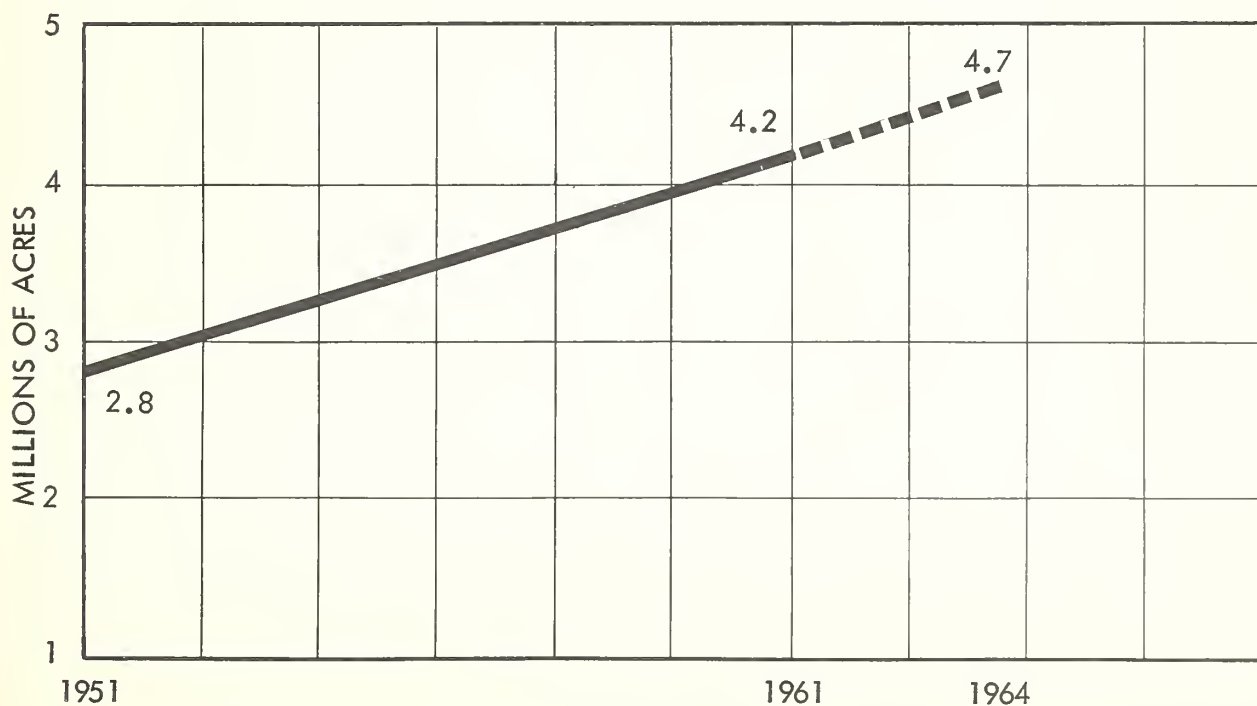
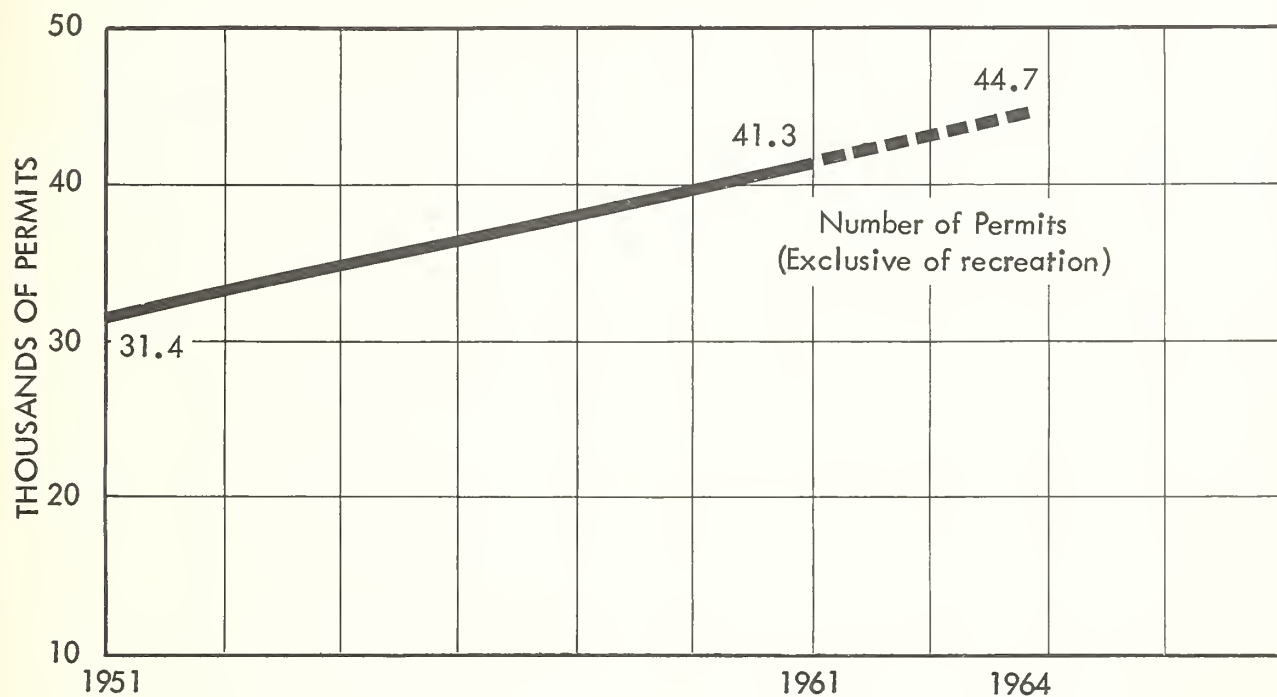


Rehabilitation of Strip Mined Area

Fishing in one of the small ponds in a strip mined area four years after rehabilitation work was started.



# The Volume of Special Uses and Easements Continues to Increase Each Year as Greater Demands are Placed National Forest Areas





## Examples of Authorized Uses of National Forest Lands



Heart's Content observatory, an example of the wide range of special uses permitted on the National Forest.



Rural School



Three TV relay stations, the highest in the nation, on the crest of the Sandia mountains near Albuquerque. This installation is on Forest Service land and is operated under Special Use Permit.



### Special Uses

National Forest land and other land administered by the Forest Service may be used for special purposes when such uses are in the public interest. Now in effect are about 37,100 special use permits covering 80 different purposes such as pastures, sawmills, television transmitters, roads, and other desirable uses, plus 22,800 additional permits for such recreational uses as resorts, ski lifts, organization sites, etc. Such permits to public agencies are issued free, those to nonprofit organizations bear but a nominal charge, and those for commercial and individual use bear a fee based on the value of the land for the purpose. Fees for special land uses totaled \$1,732,500 in 1962, in contrast to \$1,669,966 in 1961.

## Land Classification, Adjustments, and Surveys

Land Classification - A program is being established for periodic review of National Forest and National Grassland boundaries and current updating of these in consideration of changing the patterns of land use and public needs. In 1962 the Marquette National Forest in Michigan was combined with the nearby Hiawatha National Forest to facilitate administration. The boundary of the Caribbean National Forest in Puerto Rico was revised to conform more nearly with the area of Forest Service administration. Congress approved the combination of 250,000 acres of former land utilization project lands in Colorado and New Mexico with adjoining National Forests to promote more economical management.

Detailed analyses of proposed new National Forest areas in West Virginia, southern Illinois, and northern Arkansas, undertaken at the request of interested Members of Congress, have been completed or are in progress. These analyze the physical condition of the lands involved, the local economic and social situation, the relationship of the areas to national programs of land, water and forest conservation, the contributions these lands could make to economic betterment and land conservation objectives, and the advantages and disadvantages from the public standpoint, local and national, of National Forest acquisitions of substantial areas therein.

Pursuant to Departmental objectives of interdepartmental land transfers to promote more effective and economical public land management, preliminary analysis of 1.6 million acres of public domain lands in the western states which might advantageously be added to the National Forests was completed. More detailed studies of selected areas of such lands in Montana, Idaho and Colorado and of certain National Forest units in these states will be substantially completed by the end of calendar year 1962. These studies provide the basis for recommendations for transfers, either by Executive order or legislation, depending upon the authority for the respective areas. About 9,941 acres of National Forest and 9,795 acres of military-acquired lands in Ft. Leonard Wood, Missouri were interchanged to promote more effective and economical land management in that area and to consolidate both the National Forest and military reservation.

Estimates were compiled of minimum acreages which need to be acquired within National Forest for recreation use development and access, and of other lands needed to meet national programs for enhancement of public outdoor recreation areas and opportunities. These aggregate some 760,000 acres of recreational development and access lands and some 7 million acres of multiple-purpose land for extensive types of recreation, wildlife and timber production, and watershed protection. Additionally, preliminary studies were made which indicate that material benefits to land and resource conservation and redirection of croplands to other uses would accrue from a moderate purchase program under Title III of the Bankhead-Jones Farm Tenant Act in National Grassland units located in the high plains and other western areas.



Accurate land line location and good maps are essential to National Forest resource management. The use of modern equipment has greatly reduced the cost of such work and has accelerated the rate at which the resource manager's needs can be met.



Land Exchange and Ownership Adjustments - There is a continuing need for adjustments in the pattern of the Government's landownership in National Forests, National Grasslands and the Land Utilization projects administered by the Forest Service. To meet this need the Congress, under a number of separate laws has authorized the exchange of lands to promote consolidation of the Government's holdings for more effective resource protection and development, greater public service and more efficient management. Also, through these exchange transactions Government lands suited to and needed for private, community or industrial development can be made available for such purposes.

At the end of fiscal year 1962 145 approved land exchange cases were being processed through the final steps preparatory to consummation. When these exchanges are completed the United States will have acquired 142,785 acres of private and State lands and given in exchange 87,863 acres of Government lands and approximately 7 million board feet of Government timber.

Land Status Records - Complete and accurate records of landownership and status are an essential working tool of Forest Service land managers. To meet this need which has not been adequately served in the past by existing records, a revised records system was developed. In fiscal year 1962 work was begun on installing this system in each Forest Service Region and this work is continuing in fiscal year 1963. It is planned to increase the rate of installation of the new records system three-fold during fiscal year 1964. Lack of reliable status and ownership data is hampering management and resulting in costly delays and mistakes. This work is an essential preparatory step to carrying out the land line location project described below.

Land Line Location - The primary purpose of the accelerated land line location program, initiated in 1958, is to properly monument and perpetuate the property corners, and mark and post the property lines of all of the 186 million acres of forest lands under the administration of the Forest Service. Land values continue to rise and the Government's interest in land and improvements will continue to be jeopardized by trespass and adverse ownership claims until all of the National Forest property lines are permanently marked and posted on the ground.

During calendar year 1961, field search was made by Forest Service personnel for 15,840 property corners and 9,200 of these corners can be remonumented without additional cadastral surveys. In addition, 10,261 corners were permanently monumented with brass capped iron post; 253 miles of property lines were marked and posted to standard; and 5,864 miles of lines were marked to partial standard to perpetuate the location of the lines. All of the remaining property corners must be searched for, and remonumented, before the true property lines can be marked and posted.

The program estimate of 820,000 property corners and 208,000 miles of property lines is presently being revised to include National Grasslands, Land Utilization Projects, and all other lands administered by the Forest Service that were not included in the original program estimate prepared in 1958.

Mapping - During fiscal year 1962, 43,573 square miles of planimetric mapping and 1,193 square miles of topographic mapping were completed. Contracts for aerial photograph for mapping purposes were awarded for an additional area of 1,360 square miles.

Reliable maps meeting the requirements for accelerated management activities are now available for about 38% of the area of need. Topographic mapping at required scale and accuracy is available for approximately 35% of the required coverage.



Forest fires such as this annually destroy hundreds of thousands of National Forest acres of valuable forest resources and cost millions of dollars to suppress. Human life is frequently lost in combatting such conflagrations.

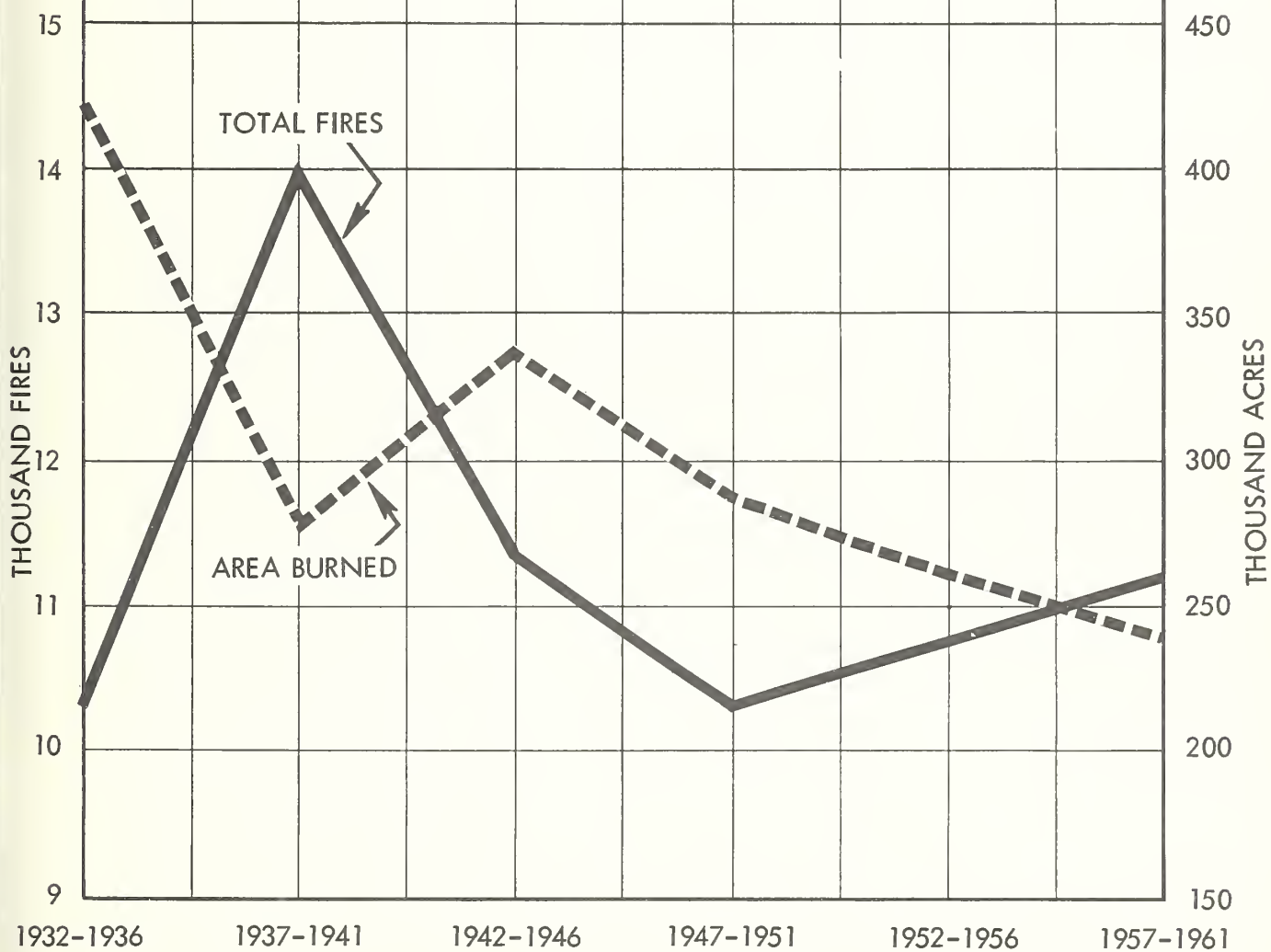


Fire destroys timber, wildlife, recreation and watersheds. Resource values are lost both for now and future generations.



# Number of Fires and Area Burned For Areas Protected by the Forest Service

## Five-Year Averages





## Forest Fire Protection

The key to successful fire control is to have available adequate forces of well-trained and properly equipped fire control people to do effective fire prevention, and to quickly detect and suppress any fire which starts. Fire control techniques and procedures continue to be changed to effectively utilize new findings of research and development and to take advantage of improvements developed in fire control field experience. Aggressive and modern training is required to maintain competency of fire control personnel and insure they are using current technology.

To emphasize and implement fire control training, a national training workshop was held to improve training devices, material, and procedures. National schools were conducted in fire generalship, fire behavior, and fire control business management for about 150 fire supervisors. A crew boss training film was completed. Teaching machines were tested and a limited number are being acquired. A simulator for training fire control personnel is being developed.

It is important to prevent as many fires from starting as possible. The fire prevention program was strengthened and emphasized in 1962 to meet a far greater use of the National Forests by recreationists, timber operators, miners and other users. Special emphasis is being given to preventing debris burning fires and to individual contacts with possible fire starters.

The Forest Service participated with the Weather Bureau in developing an improved mobile fire weather forecasting unit. The Weather Bureau is completing 13 of the units and placing them at strategic locations in the western States for use on forest fires and controlled burning.

Equipment development and testing is going forward on about 25 major projects to improve fire control efficiency. A pilot model fire weather telemetering device was successfully tested and limited numbers are being acquired for further study and use.

Evaluation tests were made on several types of aircraft used for air tankers. An evaluation study of retardant use by aircraft on forest fires is underway to improve effectiveness and safety. Improved mixing and loading equipment and safer and more efficient methods of application of fire retardants are being sought. A radio controlled glide bomb to carry retardants is being developed. The program to improve packaging and rapid unloading of cargo in aerial delivery is continuing. Additional accessories to improve helicopter use in fire fighting are being developed. A Service-wide program is underway to convert fire hose couplings to a national standard so fire fighting agencies will be using interchangeable equipment.

There were eight mobile interregional suppression crews with aerial transportation in 1962. These highly trained fire fighters located in Oregon, California, Idaho, Montana, and Colorado were used to back up local initial attack forces on many fires in western Regions.

Records for the first ten months of 1962 show that initial attack was fast and effective in most instances. Total number of fires was 26 percent less than in 1961 and burned area was reduced to approximately 36 percent of that burned during the comparable period in 1961.

The fire problems of a nuclear attack could be far greater than ever encountered previously. The Forest Service is providing leadership in planning and preparing for the fire aspects of civil defense in rural areas. In 1962 personnel worked with other members of the National Defense advisory committee in conducting the Second National Fire Defense and Command Schools at Battle Creek, Michigan for about 50 key people involved in rural fire defense.

#### Construction and Maintenance of Structural Improvements

Construction funds were used to provide new buildings to meet the most urgent needs of the expanding National Forest programs. Emphasis continues on construction of dwellings and barracks to provide housing and crew quarters at locations where private rentals are not available to meet the needs. Field headquarters offices are being expanded and obsolete offices replaced to provide adequate working space. Construction of service buildings such as warehouses, shops, and storage buildings at Ranger Stations has proceeded to fill the most urgent program needs.

Following is a summary of the major fiscal year 1962 accomplishments:

	Number of Units	
	Construction	Betterment
Dwellings .....	103	44
Barracks, cabins, and house trailers .....	18	8
Fire lookouts .....	45	9
Service and storage buildings - all types ...	245	103
Airports, helispots, and heliports .....	14	3

Approximately 76 percent of this construction and betterment was done with funds under the National Forest Protection and Management activity and 24 percent from all other appropriations.

High priority maintenance was accomplished on existing general administrative improvements, consisting of 1,850 fire lookouts, 5,500 dwellings, barracks and cabins, 700 offices, 6,500 service buildings and related utility systems, and airports.

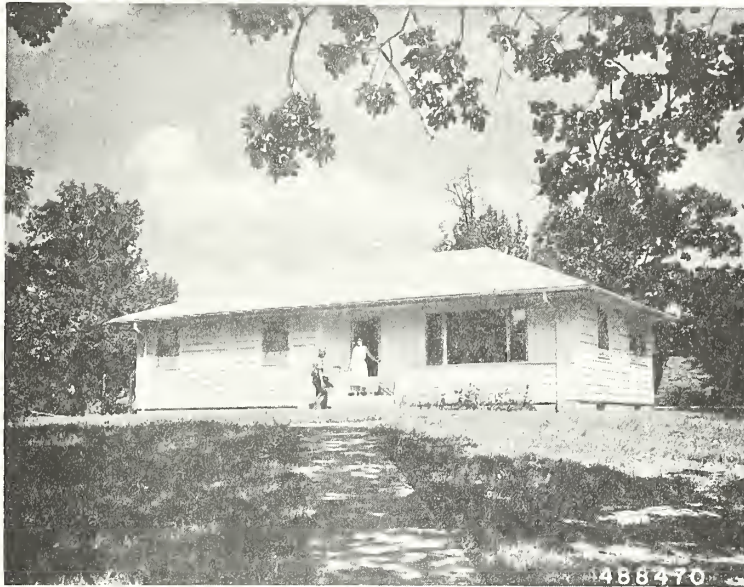
The communication network was improved by addition of 2,100 radiophones. Maintenance was provided for 16,657 radiophones and approximately 20,000 miles of telephone line.



Strategically located fire lookout towers facilitate early detection and reporting of fires so that suppression action can be taken promptly to hold the burned area to a minimum.



Many ranger district headquarters and field projects are located in remote areas or small communities where adequate housing is not available. Suitable quarters must be provided by the Government so that employees can be housed at these locations to facilitate adequate and economical management, protection, and development of the National Forest lands they administer.



Typical Forest Service dwelling



Barracks building for project crews



### Fighting Forest Fires

Current Activities: This program covers fire fighting on the national forests and the buildup of emergency fire fighting forces under peak burning conditions. Experience has demonstrated that material savings are made by having a strong force ready to discover, attack, and stop fast-spreading fires while they are small. Costs for the regular fire protection organization are financed from the National forest protection and management activity of the Forest Protection and Utilization appropriation. The temporary buildup in forces when fire conditions are critical and for the suppression of fires is financed from the "Fighting Forest Fires" activity to the extent that such needs cannot be met from the regular fire protection financing.

#### Selected Examples of Recent Progress:

The Calendar Year 1961 Fire Season - 1961 was one of the most severe forest fire years in the history of the Forest Service. There were many large fires in the western States with the greatest losses in Idaho and California. Prolonged periods of no precipitation, high temperatures and low humidities coupled with extended drought of two to five years in various areas made the fire danger extreme in Montana, Idaho, Oregon, Utah, Nevada, California, and Arizona.

There were 15,159 fires on the national forests in 1961. However, 224,394 acres burned was a significant reduction from 1960 when 424,295 acres burned. The 1956-1960 five-year average for number of fires is 10,645 and for area burned is 245,663. Greatest increases in number of fires were in the western Regions which had more forest fires than any other year of record, most of which were caused by lightning.

Nineteen men lost their lives fighting forest fires. Nine were killed in aircraft accidents, three by falling snags, three in motor vehicle accidents, three burned to death, and one died from heat exhaustion.

The Calendar Year 1962 Fire Season - In contrast to the previous three years, 1962 through October was less severe in the western Regions with 33 percent fewer fires than 1961, and 15 percent less than the 1959-1961 three-year average. The start of the 1962 season was about normal whereas in the previous three years the fire seasons started two to four weeks earlier than normal. Burned area in the western Regions during the first ten months was held remarkably low with only 50,361 acres burned which is 76 percent and 82 percent less, respectively, than the same ten months period in 1961 and the 1959-1961 average.

Fire danger in the Central and Southern States during the spring fire season was greater than normal because of severe drought conditions in the winter and early spring months. The three eastern Regions had 2,303 fires, 30 percent more than 1961 and 27 percent above the 1959-1961 average. The 29,505 acres burned in these regions was 87 percent and 45 percent greater, respectively, than 1961 and the three-year average.

During the first ten months of 1962, a total of 10,898 fires burned 79,866 acres compared to 14,641 fires and 221,920 acres burned in 1961 for the same period.



New and improved equipment and methods are constantly being developed and tested to facilitate fire control and to reduce suppression costs and resource losses.



## Insect and Disease Control

Current Activities: The purpose of this program is to reduce losses in the Nation's forest resources caused by destructive forest insects and diseases. It is carried out in cooperation with other Federal and non-Federal agencies. Federal participation is authorized by two national pest control laws. The Lea Act of 1940 applies specifically to control of the introduced white pine blister rust disease. The Forest Pest Control Act of 1947 applies to forest insects and all other tree diseases.

### Selected Examples of Recent Progress

#### White Pine Blister Rust - Calendar Year 1961

White pine blister rust, a serious disease of soft pines, was accidentally introduced from Europe in the early 1900's. It has since spread to all major white pine forests in the Nation. Widespread damage has been prevented by a continuing program of control which presently encompasses 12 million acres of white pine-bearing land in 32 States. In the Eastern and Lake States, control has been established on a large portion of the white pine stands. Maintaining that control is now the principal need. In western States the disease remains uncontrolled on 2 million acres and only partially controlled on 760 thousand acres. Hence, a major part of the 1961 program was in western States. Through the use of the recently developed antibiotic fungicide treatment, good progress was made in northern Idaho where the disease is especially virulent and damaging. Of special significance is the success achieved by aerial application of these fungicides.

Highlights of accomplishments in blister rust control in 1961 are:

1. 12.5 million western white pine trees on 67,400 acres were treated by applying antibiotic fungicide to the basal stem by hand equipment or to foliage by aircraft.
2. Control accomplishments by eradication of the ribes host in Idaho and other sections of the country include:
  - a. Initial work done on 51,000 acres.
  - b. Rework done on 88,000 acres.
  - c. Maintenance work done on 1.7 million acres.
  - d. Surveys made on 1.2 million acres.
  - e. Ribes host destroyed totaled 6.5 million.

## Insects and Diseases Other Than Blister Rust

### Detection and Evaluation Surveys

#### Forest Diseases

Distribution of oak wilt unchanged in Appalachian Mountains and Ozark Plateau - Cooperative surveys by Federal and State agencies revealed no change in the overall distribution of oak wilt in Eastern and mid-Western States. Aerial and ground inspection of over 40 million acres of public and private forest lands resulted in discovery of about 5,000 infected trees. A like number was found last year. Federal and State governments continued program work to eradicate infection centers and prevent spread.

Residual pines in thinned second-growth plantations severely damaged by root rot - Fomes annosus, a killing root-rot in pine plantations, was found in damaging proportions in Eastern States. The disease was most severe where trees had been planted on abandoned farm lands and after plantations had been thinned. In severely affected areas, efforts are being made to control the disease by creosoting freshly cut stumps or by spraying the stumps with urea.

Ash and oak decline severe in Northeast - A malady of unknown cause is killing limbs and branches of oak and ash at many locations in the Northeastern States. Scarlet oaks were severely affected and many of them died in parts of Pennsylvania and neighboring States. Ash decline was severe in New York, Massachusetts and Vermont.

Coniferous forests in Western States affected by dwarfmistletoes - Young and old pines and firs in western forests are weakened, retarded and sometimes killed by dwarfmistletoes. Surveys have shown these parasitic plants to be widespread in many coniferous stands. Work is underway to determine the impact of this disease.

#### Forest Insects

Epidemics of mountain pine beetle in Utah worst in thirty years - Explosive increases in populations of mountain pine beetle in Utah, and in western Wyoming and southern Idaho, resulted in the killing of more than 600,000 lodgepole pines in 57 infestation centers. Major campaigns were waged to combat the beetles to prevent further increases and spread.

Southern pine beetle epidemics erupt in south and southeast - Virulent outbreaks of southern pine beetle occurred in widespread areas in east Texas, Alabama, Mississippi, South Carolina and Georgia. Many thousands of trees were killed singly and in groups up to 800. Public and private agencies joined forces to suppress the outbreaks. Infested trees were salvaged or sprayed with toxic oils. Control projects are continuing.

## Control of the White Pine Blister Rust.



Young white pine infected with stem girdling blister rust cankers.



Preventing the spread of blister rust by eradicating ribes plants with chemicals.



Blister rust infection in western white pine is killed by spraying recently developed antibiotics onto tree trunks with hand sprayers or onto tree foliage from aircraft. This is a major breakthrough in the long fight against this destructive disease.



Sudden and severe outbreaks of pine tussock moth occurred in Minnesota and Wisconsin. For the first time in many years, a pine tussock moth occurred in outbreak numbers at several places in Minnesota and Wisconsin. Stands of red pine, jack pine, and white spruce were severely defoliated on approximately 65,000 acres. Damaging outbreaks were suppressed by aerial sprays during the spring months.

Western hemlock looper epidemic reappeared in Pacific Northwest after ten-year absence. After a ten-year absence, the western hemlock looper reappeared in epidemic numbers on about 70,000 acres of hemlock forests of western Oregon. Suppression was attained by aerial spraying.

Larch casebearer continued its spread in Idaho and invaded Montana. The larch casebearer, first discovered in Idaho in 1957, continued its spread in that State and invaded Montana. Infestations now occur over a gross area of 9,000 square miles. Control of casebearer infestations is being attempted by propagation and release of parasites. Establishment of an effective parasite is indicated by recovery from release points.

Pandora moth infestations in Rocky Mountains on wane due to natural control factors - The pandora moth, a major pest of pine forests in the Western States, has occurred in epidemic numbers at several locations in Oregon, Colorado, Wyoming and Utah since 1959. In 1961, most infestations declined to endemic levels as a result of natural control factors. None of the outbreaks required direct attention to suppress them.

Elm spanworm infestations continue severe in Southeast. Oaks, hickories, and other hardwoods were severely defoliated by the elm spanworm in the tri-State area of Georgia, Tennessee, and North Carolina. Gross area of defoliation was in excess of 1.5 million acres. Control was limited to high use recreational areas and high value watersheds.

Pine needle miner infestations damaging large areas in West - Ponderosa and lodgepole pines were damaged on extensive areas in Utah, Idaho, Montana and California by needle miners. The most severe infestations in the latter State, at Yosemite National Park, were sprayed by helicopter to prevent wholesale tree killing. No control was attempted in other outbreak areas.

Spruce budworm infestations widespread - Large acreages of spruce and fir in eastern and western forests were heavily infested by spruce budworm. For the country as a whole, defoliation ranging from light to heavy occurred in close to 10 million acres. The most severe infestations, those in Maine and in parts of Minnesota, were sprayed for control.

Engelmann spruce beetle less destructive in Rocky Mountains - The scope and severity of Engelmann spruce beetle infestations were less in the Rocky Mountains than for the past several years. Control was attained largely by salvaging infested trees, by trapping the beetles in felled green trees which were later logged, and by chemical spraying of infested trees.

Extreme Cold Weather Checks Outbreaks of Black Hills Beetle in Colorado -  
An arctic air mass over the Front Range of the Rocky Mountains in January dropped temperatures to -60° F. This extreme cold killed a high percentage of Black Hills beetle broods in infested trees. Planned suppression projects in affected areas were canceled.

Control Accomplishments - Calendar Year 1961

Insect Control

During the year, 185 control projects to suppress outbreaks of destructive forest insects were conducted on 80 National Forests and 16 areas of non-Federal land in 35 States. Suppression activities were directed against ten species of bark beetles and seven other insects, such as weevils, spittlebugs, scales, shoot moths and aphids. The largest and costliest projects were against bark beetles. Over 1,219,000 infested trees, stumps and cull material were treated to control this tree killer. In addition, about 23 million board feet of bark-beetle-infested timber were removed by salvage logging operations.

In contrast with previous years, only limited aerial spraying operations were conducted against defoliating insects. Aerial spraying operations were carried out to control spruce budworm on 81,000 acres in Maine and Minnesota. Other insects necessitated aerial treatment of 6,500 acres.

With the discovery of the European pine shoot moth in the State of Washington, the Forest Service cooperated with the States of Oregon and Washington and the Agricultural Research Service in surveys to locate all infested trees. About 587,000 trees were examined, 800 infested ornamental trees removed and burned, and a satisfactory method of fumigating developed. Also, State and Federal quarantines were invoked to prevent movement of infested material into non-infested Northwestern areas.

Land Ownership	Bark Beetles		Defoliators		Other Insects	
	Trees	Control	Acres	Control	Acres	Control
	Treated <sup>1/</sup>	Costs	Treated	Costs	Treated	Costs
National Forests .	1,106,558	\$2,185,778	11,166	\$ 66,774	5,848	\$132,175 <sup>2/</sup>
Non-Federal .....	113,005	208,216	70,000	73,378	629	39,234
Total .....	1,219,563	2,393,994	81,166	140,152	6,477	171,409

<sup>1/</sup> Includes infested trees, stumps, and cull material.

<sup>2/</sup> Includes Federal expenditures of Forest Pest Control Act funds on cooperative projects on non-Federal land.



Bark beetles kill trees by girdling the inner bark surfaces of the stem.



Bark beetle epidemics lay waste vast amounts of high-value timber in the West and South.



### Disease Control

Participation was continued in Federal cost sharing oak wilt control projects on State and private land in Arkansas, Kentucky, North Carolina, Pennsylvania, Virginia and West Virginia. In these States, 42 million acres of State and private land were surveyed to detect oak wilt infected trees. A total of 4,056 were located and treated. In these same States, 3.6 million acres of national forest land were surveyed. A total of 108 infected trees were located and treated on these lands.

Dwarfmistletoe control is largely attained through timber cutting and improvement practices. To facilitate control by these practices, 34,870 acres of national forest land were surveyed and mapped. Also, a pilot control project was continued in Oregon to determine cost-benefit ratios and feasibility of dwarfmistletoe control in young ponderosa pine stands.



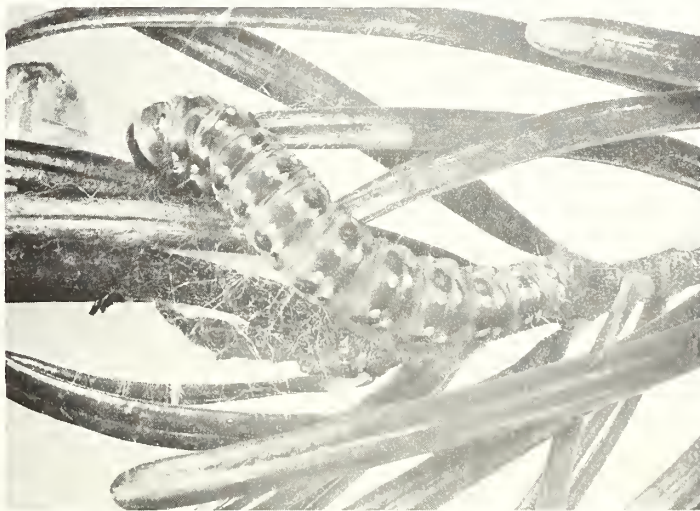


Several methods are used to suppress outbreaks of bark beetles. Infested trees are logged, sprayed with toxic oils, or piled and burned, during winter months.

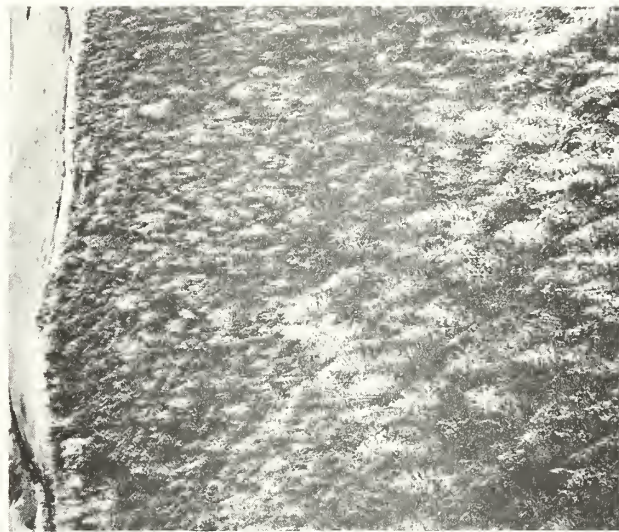


## COMBATTING THE SPRUCE BUDWORM

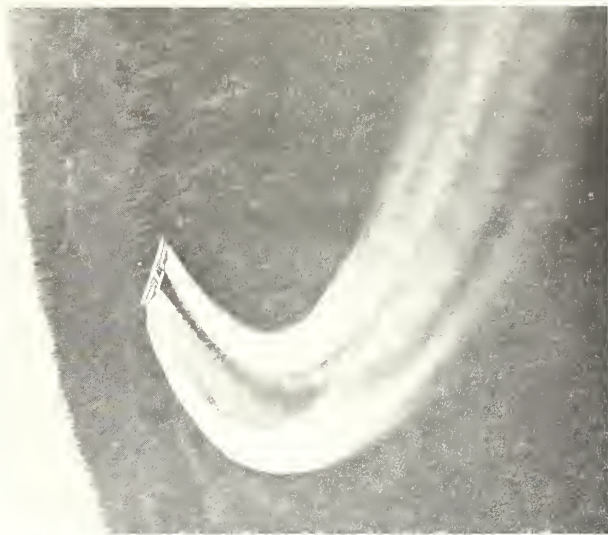
### The Forests Most Serious Defoliator



One of countless millions of spruce budworm larvae devouring fir needles.



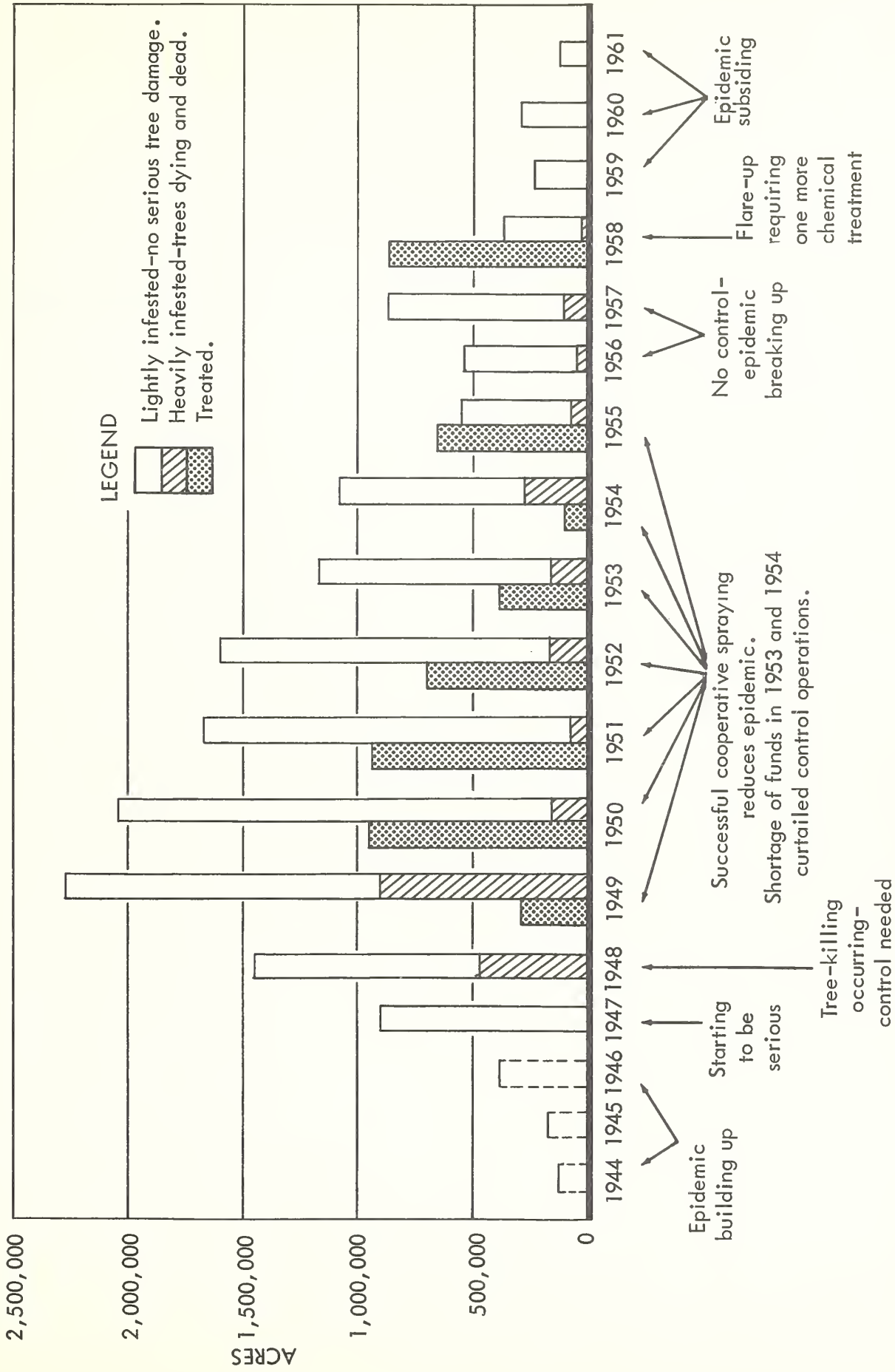
Douglas fir forest in Montana attacked by budworm. Several million acres of fir and spruce forests from coast to coast are similarly infested.



Raining death on the budworm. One pound DDT per acre brings quick, effective, and inexpensive control.



# History of a Spruce Budworm Control Operation in Oregon and Washington





OBLIGATIONS, INSECT AND DISEASE CONTROL FUNDS  
(Exclusive of White Pine Blister Rust Control)  
FISCAL YEAR 1962 AND ESTIMATES FOR FISCAL YEARS 1963 and 1964

Project	1962	1963 :(estimated) <u>1/</u> :	1964 :(estimated) <u>1/</u> :
<u>Forest insects feeding on or under</u>	:	:	:
<u>the bark 2/</u>	:	:	:
Northern Rocky Mountain States ...	\$38,611:	\$50,000:	\$50,000
Rocky Mountain States .....	223,707:	235,000:	210,000
Southwestern States .....	142,950:	65,000:	60,000
Intermountain States .....	2,248,517:	1,630,000:	1,010,000
California .....	382,033:	305,000:	420,000
Pacific Northwest States .....	19,024:	25,000:	20,000
Eastern States .....	2,259:	14,000:	10,000
Southern States .....	382,194:	305,000:	940,000
<u>Forest insects feeding on cones, 3/</u>	:	:	:
<u>seeds, buds, shoots, or foliage</u>	:	:	:
Northern Rocky Mountain States ...	309,787:	525,000:	510,000
Rocky Mountain States .....	99,449:	410,000:	50,000
Southwestern States .....	421,840:	305,000:	100,000
Intermountain States .....	- - :	505,000:	920,000
California .....	730:	10,000:	10,000
Pacific Northwest States .....	102,191:	46,000:	40,000
Eastern States .....	10,100:	27,000:	50,000
Southern States .....	28,227:	73,000:	100,000
North Central States .....	245,692:	203,000:	100,000
Alaska .....	- - :	30,000:	10,000
<u>Forest tree diseases 4/</u>	:	:	:
Northern Rocky Mountain States ...	- - :	15,000:	15,000
Rocky Mountain States .....	1,264:	15,000:	15,000
Intermountain States .....	2,549:	5,000:	15,000
Pacific Northwest States .....	44,165:	50,000:	60,000
California .....	11,800:	15,000:	25,000
Eastern States .....	68,062:	90,000:	90,000
Southern States .....	12,000:	20,000:	25,000
<u>Administration, surveys, and pre-</u>	:	:	:
<u>control work 5/</u> .....	1,238,302:	1,692,500:	1,747,000
<u>Department of Interior forest in-</u>	:	:	:
<u>sect and disease projects</u> .....	345,329:	404,500:	601,000
<u>Total available or estimated</u> .....	<u>6/</u> 6,380,782:	7,070,000:	7,203,000

1/ Estimates of project needs are forecast a year or more in advance of anticipated needs and are always subject to fluctuations. Adjustments are made between projects as necessary, depending on discovery of new outbreaks and expanded needs on approved projects.

2/ Includes mountain pine, western pine, southern pine, Engelmann spruce, black turpentine beetles, Ips, flatheaded borers, balsam woolly aphid, and scale insects.

- 3/ Includes spruce budworm, jackpine budworm, Douglas-fir tussock moth, elm spanworm, sawflies, Saratoga spittlebug, European pine shoot moth, white pine and reproduction weevil, seed and cone insects.
- 4/ Includes oak wilt, dwarfmistletoe, and Fomes annosus.
- 5/ This item provides for administration of the Forest Pest Control Act, for continuous pre-control activities, for quick action on many projects nationwide to stop outbreaks while they are small, and for detection and evaluation surveys.
- 6/ Includes \$334,157 of P&M and \$61,624 of Blister Rust Control funds reprogramed to meet insect control needs.

DEPARTMENT OF THE INTERIOR

(Activities under funds transferred from this  
Appropriation for Insect and Disease Control)

Introduction

Prevention of serious losses from diseases and insects in the forests under the jurisdiction of the Department of the Interior is an important activity under the Forest Pest Control program. Approximately 182 million acres of Forest and woodlands are administered by the Department of the Interior, including 8.3 million acres by the National Park Service, 2 million acres by the Bureau of Sport Fisheries and Wildlife, 13.1 million acres by the Bureau of Indian Affairs, and 159.8 million acres by the Bureau of Land Management.

Control Accomplishments

White Pine Blister Rust

There are 554,442 acres of control area administered by the Department of the Interior of which 382,056 are under the direction of the National Park Service, 72,549 under the direction of the Bureau of Land Management, and 99,837 under the direction of the Bureau of Indian Affairs.

The Bureau of Indian Affairs continued ribes eradication on 99,837 acres of white pine forest lands in the Great Lakes States. The work is being accomplished by Indian workers on the Great Lakes and the Minnesota Indian Reservations. These reservations encompass the States of Minnesota, Michigan, and Wisconsin. During the past calendar year of 1961, a total of 830 effective man-days were expended in blister rust control that resulted in ribes eradication on 3,974 reservation acres with a total of 99 thousand ribes destroyed.

There are 72,549 acres of control area administered by the Bureau of Land Management. The Bureau in its control work is involved in a three-pronged program:

1. Control through ribes eradication.
2. Use of antibiotics to control blister rust in sugar pine.
3. Development of rust resistant sugar pine trees through controlled pollination.

Originally the use of antibiotics on sugar pine did not give consistently successful results as in the case of their use on western white pine. Further tests, however, have indicated that the use of antibiotics will be successful as a control measure.

The development of rust resistant sugar pine trees through controlled pollination of rust resistant trees offers the opportunity for further intensification in the management of sugar pine and could lead to elimination of the other control methods. At the present time, seedlings from the first seed collected from controlled, pollinated trees are now being raised in the Wind River nursery for testing their subsequent resistance to blister rust.

Control of white pine blister rust is conducted by the National Park Service in 15 national park areas containing 382,056 acres in control units. Control is accomplished by eradication of ribes or using Actidione wherever applicable. Ten new survey units at Glacier and Yellowstone were added to the program for these parks in 1962. They are located in public use and scenic zones where western white pine is a predominate climax species. Deferment of control has continued in Sequoia and King's Canyon, and all of Yosemite National Park south of the Merced River where there is a low infection risk.

#### Insects and Other Diseases

The importance of maintaining the forests in a healthy condition continues to grow, especially as public use increases. This has intensified the need for much additional control work. Furthermore, the maintenance of insect populations at endemic levels in the far West is becoming increasingly difficult due to continued below normal moisture conditions.

Control of dwarfmistletoe infections on limber pine has been initiated at Craters of the Moon National Monument.

The second year of a dwarfmistletoe control program was completed on the Mescalero Indian Reservation in New Mexico. The control project is to test the effectiveness of cleaning mistletoe infected trees and limbs from commercial ponderosa pine stands. During fiscal year 1962 a total of 4,055 acres were treated on which 42,844 infected pine trees were cut and 2,930 trees pruned. A total of 753 man-days were expended to accomplish these results.

Outbreaks of barkbeetles in pines at Grand Teton, Lassen Volcanic, Yosemite, Sequoia and King's Canyon National Parks have continued from fiscal year 1962.

Control of the lodgepole pine needleminer infestation at Yosemite in fiscal year 1962 destroyed 90 percent of the adult moths. Some maintenance control is anticipated in fiscal year 1964 and a new unit in Kings Canyon National Park will require treatment in fiscal year 1964. This is just west of the crest of the Sierras in an area that is used by many campers, hikers and fishermen. The adult needleminers mature in the odd years hence control is programed in July and August 1963.

A number of the insect control projects are jointly executed with State and other Federal agencies. Inadequate financing in the last half of fiscal year 1962 required curtailment of control projects involving major barkbeetle outbreaks.

During fiscal year 1962, insect projects on the Santa Rosa Indian Reservation in California and the Uintah and Ouray Indian Reservation in Utah were conducted with successful results. On the Santa Rosa Reservation, 100 sugar pine trees were felled and sprayed to control a potential Ips beetle outbreak. The project on the Uintah and Ouray Reservation consisted of spraying 328 lodgepole pine trees to control a concentration of mountain pine beetles.

Approximately 7,000 acres on the Yakima Indian Reservation in Washington were aerial sprayed during July 1962 to control a spruce budworm buildup. This was part of a joint project involving the State of Washington, Bureau of Indian Affairs, Forest Service and private landowners. Although final reports have not yet been received, preliminary evaluations report favorable results.

Spruce budworm infestations are reported on a large area of the Navajo Indian Reservation. An aerial spraying project to control this infestation that was postponed during 1962 due to lack of funds has been scheduled for the summer of 1963. Also, a buildup of Great Basin Tent Caterpillar infestation has been reported on the Navajo Reservation covering approximately 40,000 acres of aspen stands. Ground surveys are being conducted at the present time to determine the severity of the outbreak and suitable control measures.

Three Black Hills beetle control projects were carried out during the year in Wyoming and Colorado. Two were in Colorado, and one in Wyoming, all of which were individual tree spray projects. Due to limited funds, the programs were closed down without entire area coverage; however, very good results were reported on the areas sprayed.

The Wyoming project, located in the South Bighorn of the Mt. Casper District, was found to be much larger than estimated. 5,331 trees were treated and there are an estimated 15,000 additional trees needing treatment. Increased infestation is expected next year due to lack of funds this year to complete the control work.

### Acquisition of Lands

New emphasis is placed upon the need for land acquisition in the Development Program for the National Forests. The land purchase program for the 10-year period beginning with fiscal year 1963 provides for the purchase of about 500,000 acres important for recreation development and use, and about 950,000 acres important for other resource management purposes. The objective of this program is to consolidate Government ownership through the acquisition of key tracts of inholdings in the National Forest and National Grasslands which are essential to effective program installation and efficient administration. These are voluntary sales of private landowners who wish to dispose of their lands. In fiscal year 1962 \$300,000 was available for Weeks Law land purchase. This was increased to \$500,000 in fiscal year 1963.

The fiscal year 1962 funds were obligated in land purchase cases approved by the N.F.R.C. Approved cases included 149 tracts totaling 20,355 acres in 21 National Forests located in 15 States. The lands to be acquired in each of the cases will beneficially consolidate Government holdings. Moreover, many of these tracts contain areas of land which have been in cultivation. Acquisition of these areas removes them from agriculture production in furtherance of the Department of Agriculture's program for the diversion of surplus agricultural lands to other uses.



Effective management of the National Forest System requires reasonable consolidation of ownership where there are intermixed public and private lands. Denuded forest land such as this is purchased for ownership consolidation and for restoration of its resource potential by rehabilitation, protection, development, and proper multiple-use administration.



Land similar to that shown above after approximately 15 years of National Forest administration. Acquisition and restoration of such lands is an important part of the Development Program.



## FOREST RESEARCH

The Forest Service conducts research on problems pertaining to all forest land and on the management of related non-forest rangelands, including State and private holdings as well as National Forests and other Federal lands.

The research is carried on primarily at the Forest Products Laboratory, Madison, Wisconsin, at ten regional Forest and Range Experiment Stations in the continental United States, and at the Institute of Tropical Forestry in Puerto Rico. Much of the research at the regional Stations is concentrated in laboratories or at experimental forests and ranges where major problems may be studied advantageously.

The research is to a large extent cooperative with States and private agencies. Research is underway in the following fields:

### Forest and Range Management Research

Current Activities: Research under this activity is concerned with the growing of timber and related tree crops, the management and efficient use of range forage for domestic livestock and habitat for fish and wildlife, the management of both forest and range vegetation to produce the greatest amount of usable water and to minimize erosion, and the management of forest recreation resources.

Forest management research emphasizes the development of methods for quickly increasing the growth rate of forests and hence the permissible annual cut. Emphasis is given to harvest cutting patterns that promote regeneration of the forest or increase growth and quality of residual stands. Also being stressed are measures leading to control of undesirable vegetation competing with crop trees. Methods of reforesting farm lands withdrawn from cultivation, stripped mining lands, and cut or burned-over forests, are being improved through research. The development of hybrids or selected races of trees for faster and more certain timber production is being studied, as well as improved methods for stimulating gum flow in pines for the production of resin.

Wildlife habitat and range management research emphasizes development of methods and practices for building up or maintaining forage production on forest and related non-forest ranges, and for its efficient utilization by game and livestock, at maximum levels consistent with other values of land for watershed, recreation, timber production, or other uses. Emphasis is being placed on determination of proper intensities of stocking, systems of grazing, and seasons of use for native ranges, seeded ranges, and ranges on which undesirable plants have been controlled. Methods are being developed for coordinating livestock and big game use of the same ranges. Studies are also underway on the use of fire in the control of undesirable range plants, and the development of methods for restoring and managing desirable forage plants on game ranges.

Watershed management research is directed toward improving soil and cover conditions and practices to alleviate flood and sediment problems associated with the use of forest and related rangeland, and toward helping meet urban, rural, and industrial demands for water of good supply and high quality. Watershed use problems are attacked by obtaining quantitative measurements of the effects of such activities as fire, logging, grazing, and road

construction on water supply and quality. Concurrent with these studies are those to determine how to use watersheds for various economic purposes and still provide satisfactory water supplies. Possibilities of increasing water yield through manipulation of the vegetation and control of snow accumulation and melt are being studied. Particular attention is being given to the effects of watershed use and management on study areas as they are reflected in soil-plant-water relations. This provides both an understanding of the cause and effects of given measures and a means of predicting the magnitude of results from applying watershed use and management measures on other areas.

Forest recreation research concentrates on developing basic facts on forest recreation and providing guidelines essential to the forest land manager in making policy and program decisions. This research includes studies of the resource, the people who use it, and the relation of recreational use to other uses of forest land. Major emphasis is placed on: devising techniques for measuring and classifying forest recreation use, and for inventorying forest recreation resources; investigating factors influencing incentives, desires, and choice of recreation activity by the recreationist; improving procedures for making projections of future recreational use; determining methods for management, protection, and rehabilitation of the recreation resource; developing guides to determine carrying capacities of various types of recreation resources; and on studies in coordinating recreation with other forest uses, and evaluating effects of other forest uses on forest recreation values.

### Selected Examples of Recent Progress

#### Forest Management Research

Blister rust resistant trees can be bred. Some western white pine trees free of blister rust disease are able to transmit resistance to their progeny. Seedlings from supposedly resistant and non-resistant parents were inoculated with the blister rust disease fungus. Four years afterwards only 5.3 percent of the seedlings from non-resistant survived compared to 18 percent from resistant parents. The best set of parents produced progeny whose survival rate was 49 percent. The strength of the heritability is such in the best of the parents that worthwhile gains in resistance can be expected for several generations by breeding for this character.

The causes of poor yellow-poplar seed. The viability of seed of yellow-poplar, one of the more valuable broad-leaved trees, is usually so poor that tree breeding projects will be handicapped if some procedure is not developed to increase the viability. To determine the causes, a detailed study was made during the period of pollination and fertilization. The results show that ineffective pollination is the cause of the low number of good seeds. The trees are usually self-incompatible and some trees are not always compatible with other trees. Also rainy weather might restrict the activity of bees and reduce the amount of cross pollination during the few days when pollination can be effective. The implications are that compatible trees will have to be found in tree breeding projects and that there may be little selfing in controlled breeding.

Length of tree fibers can be increased by breeding. Fiber length, an important characteristic of pulpwood, can be increased by tree breeding. In a study to determine the variability in fiber length in cottonwood, trees of various ages and diameters were sampled. The study showed that in any one tree the fibers near the bark were longer than those near the pith. Age and diameter of the tree accounted for about 50 percent of the variation in fiber length. The estimate of genetic variance was 30 percent. On this basis selection of trees for long fibers might result in an average maximum length of 2.0 mm in several generations compared to an average maximum of 1.28 mm in the trees sampled.

Nursery selection identifies superior trees. The selection of outstanding seedlings in the nursery appears to be a means of identifying trees of outstanding genetic constitution. After four years selected loblolly and slash pines were 16 and 19 percent taller, respectively, than the controls. For slash pine the best seedling per 146,000 was selected. For loblolly pine the rate was 1 per 44,000. A three-man selecting crew was able to look over a nursery of 30-50 million seedlings in a day in search of these superior seedlings, which will be used for breeding material. The effectiveness of nursery selection was also demonstrated in a study in California where results after 15 years in a progeny study showed that two-year height in the nursery could be used to predict performance. About 39 percent of the variation in 15-year heights was attributed to genetic control.

Forest trees can be fertilized by plane. The possibility of supplying phosphorus to trees by an aerial spray was shown by a study of foliar application of phosphorus at Beltsville, Maryland. The upper needles of 3-month-old loblolly pine seedlings were dipped in a phosphate solution, tagged with radioactive phosphate. This dip simulated a spray. Within 24 hours radioactive phosphate was found in the root tips of the seedlings, with a maximum concentration in 48 hours. Height growth after treatment was twice that of seedlings grown without the foliar dip but was only 60 percent of that of seedlings supplied with adequate phosphorus in the nutrient solution. Five weeks after treatment, 65 percent of the phosphorus found in the new needles had been translocated from that applied as a spray.

Indicators for nutrient-starved trees. To provide guidelines to determine the nutrient status of young trees, loblolly and Virginia pine seedlings were grown in sand culture at Beltsville, Maryland, and supplied with various amounts of potassium, magnesium, and calcium. Seedlings not supplied with enough potassium developed purplish and brownish needles which finally died. The potassium concentration in the needles of deficient seedlings was usually less than 0.26 percent. Insufficient magnesium led to yellowing of the needles and terminal dieback. The magnesium concentration in the foliage of such deficient plants was less than 0.08 percent. Seedlings deficient in calcium showed yellow mottling of the needles and resin exudations on the buds. Needles on calcium deficient plants were thicker and shorter than normal and had a calcium concentration of less than about 0.03 percent.

Heavy cutting necessary to control dwarfmistletoe. Dwarfmistletoe is a major pest of ponderosa pine in the West. To study the feasibility of silvicultural control, ponderosa pine stands were treated by one of three levels of harvesting. In the first type of cutting, 77 percent of the volume was removed and the percent of mistletoe infection was reduced from 44 percent to 10 percent. In the second type, comparable data were 73 percent volume removed and 50 percent infection reduced to 5.5 percent. In the third type, the figures were 35 percent removed and 40 percent infection reduced to 36 percent. Ten years of study show that in severely diseased stands such as these, little control will be accomplished without heavier than normal cutting, perhaps coupled with follow-up cutting about 5 years after the initial cutting to remove trees with latent infections.

Pruning in red alder not recommended. Epicormic branching in red alder has long been considered a deterrent to pruning for the production of clear wood. Sectioning of 43-year-old red alder trees that had been pruned at age 21 showed that clear wood began forming over pruned branch stubs within 2 years. However, gains in wood quality were frequently offset by the development of epicormic branches. Such branches develop from dormant bud strands originating in the leaf axil that gave rise to the original live limb. Until more is learned of control of epicormic branching, the desirability of pruning red alder is questionable.

Planted Douglas-fir gives high yields. A recent measurement of planted 31-year-old Douglas-fir in northwestern Washington showed yield to be markedly higher than that of natural stands. Increased increment of planted trees is attributed to more exact spacing which permits better development of individual trees. The per acre yield of 4,583 cubic feet for the 31 years compares very closely with yields of planted loblolly and slash pine in the South.

Gum production maintained with less frequent chipping. In a study in Mississippi, with a face height limitation of 54 inches, biweekly chipping with 1-inch streaks and 60 percent acid produced 6 percent more gum over a 3-year period than weekly chipping to the same face height. These results will be of considerable value to naval stores producers faced with a shortage of chipping labor because they show high gum yields can be obtained with fewer streaks.

Blister rust treatment not harmful to mycorrhizae. The antibiotic cycloheximide is known to be effective against the fungus causing blister rust in white pine. But its toxicity to the fungi associated in the necessary mycorrhizal development of the pine was not known. It could have been possible that treatment to destroy the disease organism would also have resulted in destruction of the mycorrhizal organisms and impairment of tree growth. Various mycorrhizae-forming fungi growing in sterile culture were treated with cycloheximide over a range of concentrations to determine toxicity levels. Also white pines growing with a complement of mycorrhizae were treated with cycloheximide in fuel oil, applied as a basal spray. Most of the fungi growing in sterile culture were inhibited by a concentration of 10 ppm. However, when applied to the stem, the chemical apparently was not translocated to the roots in amounts great enough to inhibit the fungal partners of the mycorrhizae. The results of this study suggest that use of the chemical for blister rust control will not upset the necessary mycorrhizal development.



Although progress has been made in research on management of seed orchards, much remains to be done. This plantation represents one approach. Here vegetatively propagated clones of slash pines selected for high oleoresin yield are being grown under intensive culture, including irrigation, fertilization, and cultivation.



Black walnut should be pruned with caution. The great demand and high prices paid for clear walnut wood makes black walnut trees good candidates for pruning. Studies in Kansas have shown that as much as 75 percent of the crowns of 3- to 5-inches, 14-year-old planted trees can be removed without seriously retarding growth. By the end of 5 years, clear wood had formed over most of the wounds and there was no evidence of decay or insect damage. However, the number of bole sprouts increased with degree of pruning. One year after pruning more than 50 percent of the trees with 75 percent of the crown removed had bole sprouts, whereas only 6 percent of those with 25 percent of the crown removed had sprouts. Not more than 25 percent of the live crown should be removed at any one time and thinning to increase tree growth should not be done for a few years before or after pruning to inhibit sprouting.

Red alder adds nitrogen to the soil. Red alder, the most important hardwood tree of the Pacific Coast, is a soil-improving hardwood in a region where forests are predominantly coniferous. Research with other species of alder in Europe has demonstrated that these trees harbor bacteria which fix atmospheric nitrogen in root nodules. However, until now there has been no firm knowledge of this trait in red alder. A plantation of Douglas-fir in southwestern Washington was interplanted with red alder about 25 years ago. Now form class, average limb length, foliage nitrogen content, and diameter and height growth for dominant fir grown with alder is superior to adjacent fir grown without alder. Total nitrogen in the upper 3 inches of the soil profile is greater beneath the mixed stand showing the soil-improvement character of the red alder.

Wide spacing in plantations brings early yields. Information about gum yields and tree growth in a Georgia plantation emphasizes the returns from gum farming and wood production resulting from a wide spacing of 15 x 15 feet initial planting. In this study gross annual returns per acre per year were almost \$19.00 for a 26-year period. It is pointed out that wide initial spacing permits individual trees to reach a size suitable for gum production and sawlogs at an early age.

Seed production stimulated by thinning in good years. During the period 1950 to 1959 the seed crop of thinned young-growth Douglas-fir stands in western Washington ranged from about 200,000 to over 560,000 seed per acre. Seed production was about 100 percent greater in the thinned than in the unthinned stands during good seed years but was not influenced by thinning during poor seed years. The percent of seed that was viable increased with an increase in size of seed crop in both thinned and unthinned stands.

Sand pine grows well in sandhills of Florida. Sand pine planted on unprepared sites outgrew other species with little or no release from competing vegetation. Eight years after being planted, sand pine averaged 13.3 feet in height, slash pine 3.8 feet. The survival and growth of unreleased longleaf, loblolly and shortleaf pine were extremely poor. The ability of sand pine to compete successfully with oaks and wiregrass has special significance for sandhills landowners, many of whom are unable or unwilling to incur the costs of the intensive site preparation needed for other species.

## Range Management and Wildlife Habitat Research

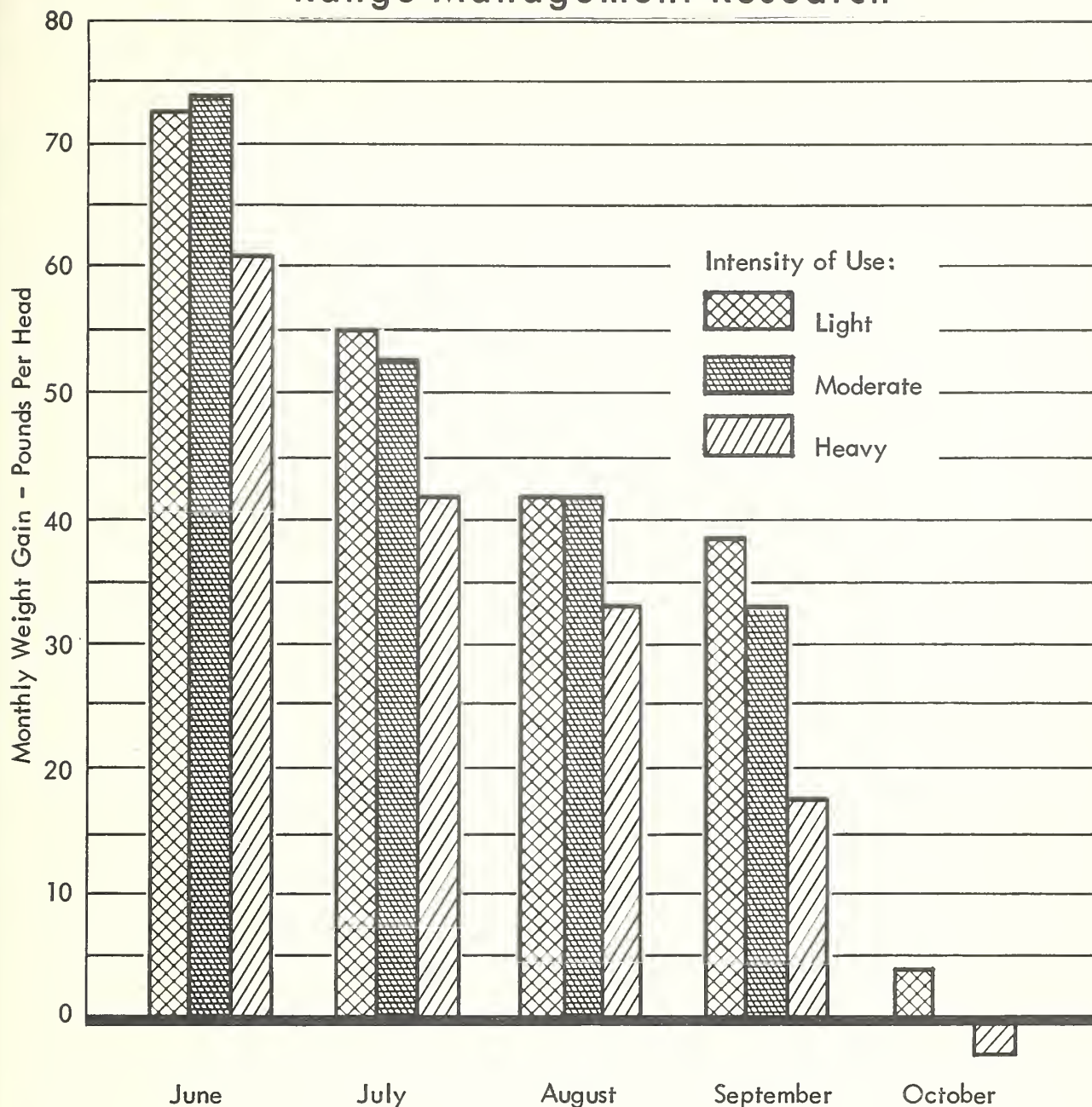
Effects of fire on range vegetation. Information on effects of fire on various forage species is particularly important in the selection of range areas to be burned for the control of big sagebrush. Studies in Idaho have demonstrated that perennial bunchgrasses are widely different in their reaction to burning. Sandberg bluegrass was unaffected by temperatures of 200° or 400° F. in June, July, or August. Bottlebrush squirreltail ranked next in resistance, followed by Thurber's needlegrass, and needle-and-thread. Large plants were generally more susceptible to fire damage than small ones. However, season of burning was more important to survival than plant size or intensity of burning. In Oregon sprouting of antelope bitterbrush following burning was found to be closely related to site condition. Frequency of sprouting of this valuable forage plant is apparently strongly influenced by texture of the surface soil, stoniness of the soil, and aspect of the site.

Litter accumulation reduces herbage yield. Complete protection of native tall grass prairie in Iowa caused an excessive accumulation of litter which decreased vigor, growth rate, and yield of the vegetation. Prescribed burning following protection caused an increase in number and height of grass seedstalks, faster vegetative growth during the early part of the season, and greater herbage production. When organic matter was again allowed to accumulate, vigor, growth rate, and yield declined rapidly. However, where annual mowing and hay removal prevented excessive accumulation of litter, vigor, growth rate, and yield decreased only slightly. This helps to explain why more forage is sometimes produced under grazing than with protection; however, it does not explain the physiological processes that make herbage accumulation detrimental.

Range fertilization as a management tool. In Florida applications of rock phosphate on native range produced extremely favorable responses in terms of forage production, increase of desirable plants, and animal use. During the first year herbage yields were more than doubled on plots receiving one ton of phosphate per acre and more than tripled on plots receiving two tons per acre. Desirable forage grasses such as goobergrass increased more than threefold. The valuable panic grasses seeded prolifically. This may prove a potent means for improving game habitat--particularly for quail. Palatability, including species ordinarily little relished, was apparently increased as cattle sought out and closely grazed the forage that grew on fertilized areas. The study also provides a striking demonstration of saw palmetto control from heavy utilization induced by fertilization.

Effects of grazing intensity on vegetation and cattle. A recently terminated study in the Bighorn Mountains of Wyoming has shown that optimum use of Idaho fescue, the key forage plant on these ranges, is about 40 or 45 percent, based on weight of herbage produced. Under that degree of use, fescue maintained its production and yearling steers averaged 2.2 pounds gain per day. Heavier use of Idaho fescue caused not only a decrease in forage production but also an increase of less desirable plants. These changes were more pronounced on granitic than on sedimentary soils, indicating that type of soil must be considered when setting allowable use of these ranges.

## Range Management Research



The development of optimum management systems and grazing intensities for many different range types and conditions has high priority in FY 1964. Such studies require many years for proper determination of plant and animal responses. For example at the end of 18 years of study on native ponderosa pine range in Colorado - heifer weight gains were markedly high under light and moderate intensity of use than under heavy use. But under all intensities weight gains decreased as the season advanced. Future studies are aimed at raising weight gains by extending the "green feed" period with seeded ranges.





A high priority problem in California is the 10 million acres of Chamise-Chaparral brush. In its present condition its values for grazing, wildlife, recreation, and water yields are low. It constitutes a high fire hazard where fires are costly to suppress.



Past research has shown how to convert the brushland to permanent grass cover by burning, seeding to adapted grasses in the ashes, controlling brush sprouts with herbicides, followed by good range management. Such conversion results in high grazing capacity, improved wildlife habitat, increased hunter enjoyment, better water yields, reduced fire hazard and greater safety for firefighters. But research must be continued to reduce present costs of \$25 an acre and to extend all major soil types. Similar research will be conducted in FY 1964 under different vegetation, soil and climatic conditions in Arizona and Missouri.





Persistent over-use by big game has had disastrous effects on habitat soil stability and watershed values over much of the West - (in this case winter elk range in the Tetons). Methods of rehabilitating such areas by artificial revegetation and good habitat management are high priority problems for research in FY 1964.



# WINTER MORTALITY OF MULE DEER IN UTAH IN RELATION TO RANGE CONDITION

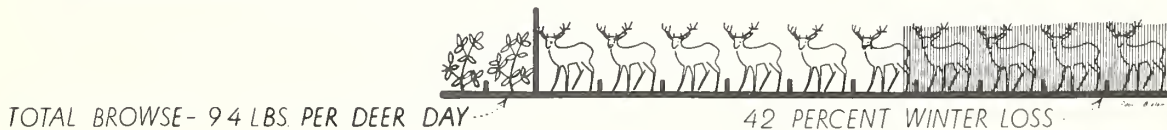
## GOOD CONDITION



## FAIR CONDITION



## POOR CONDITION



Wildlife habitat studies have shown that the ability of big game to survive rigorous winter weather is closely related to forage supply. In Utah deer losses during a severe winter averaged less than 10 percent of the herd on a good condition range where adequate browse was available, but more than 40 percent of the herd on poor condition range where browse supply was extremely short. Such information is of value in habitat management. More is needed for adequately meeting problems on all forested range. This will have high priority in FY 1964.



Advances in big-game range restoration. Studies on winter deer range in Utah have shown that most shrubs are more readily killed by competition and drought than are grasses and forbs. Grass seedlings survived drought best, and forbs were intermediate. But, big sagebrush and rubber rabbitbrush have proven most useful for revegetating big-game winter range. Their rapid growth, high production, ability to reproduce naturally after 3 to 5 years, and fair acceptance as big-game forage are important characteristics of these shrubs. Other shrubs more palatable as game forage are bitterbrush and winterfat, but these are less hardy and more difficult to establish than sagebrush and rabbitbrush.

Herbicides Used to Stimulate Basal Sprouting of Shrubs. In northern Idaho, herbicides show promise for increasing the availability of certain tall-growing browse species now beyond reach of deer and elk on their winter range. Stimulation of basal sprouting of Scouler willow and Saskatoon serviceberry can be obtained by application of 3 lbs. acid per acre of 2,4-D or brush killer (2,4-D + 2,4,5-T). However, redstem ceanothus, a desirable browse, is completely killed by concentrations of these herbicides in excess of 1 lb. acid per acre. Late summer spraying seems to have most promise for rehabilitating such winter ranges.

Food habits of antelope. A study in Utah indicates the extent to which forbs are the preferred forage of antelope in early summer. These plants make up 49 percent of the diet during June and early July, while grasses contributed 34 and shrubs only 17 percent. Since deer obtain most of their forage from shrubby plants, competition between these two big-game animals is probably not serious where their ranges overlap.

Big game prefer native vegetation. Studies evaluating deer and elk habitat in relation to livestock summer range in Utah indicate that these animals prefer native vegetation to seeded grass stands. In aspen and shrub vegetation, the use averaged 13.5 and 10.0 animal days per acre, respectively, whereas seeded stands of crested wheatgrass and smooth brome were used at the rate of only 0.14 animal days per acre. Apparently, competition of elk and deer with livestock for use of seeded range in the summer is not serious if sufficient good-quality native range is available for game.

Management to reduce grazing damage to trees. Cultivation of pine trees planted in an old carpetgrass field in south Georgia significantly increased growth of trees. By the end of the third growing season, trees that had been cultivated two or three times each year measured 32 inches in height, whereas those not cultivated measured only 24 inches. Cultivation, then, shortens the period during which trees may be injured by big-game or livestock grazing. In tests simulating browsing by deer preliminary results indicate that as much as 75 percent of the foliage can be removed without affecting initial survival of slash pine seedlings; however, as little as 25 percent foliage removal has an adverse effect on growth rate.

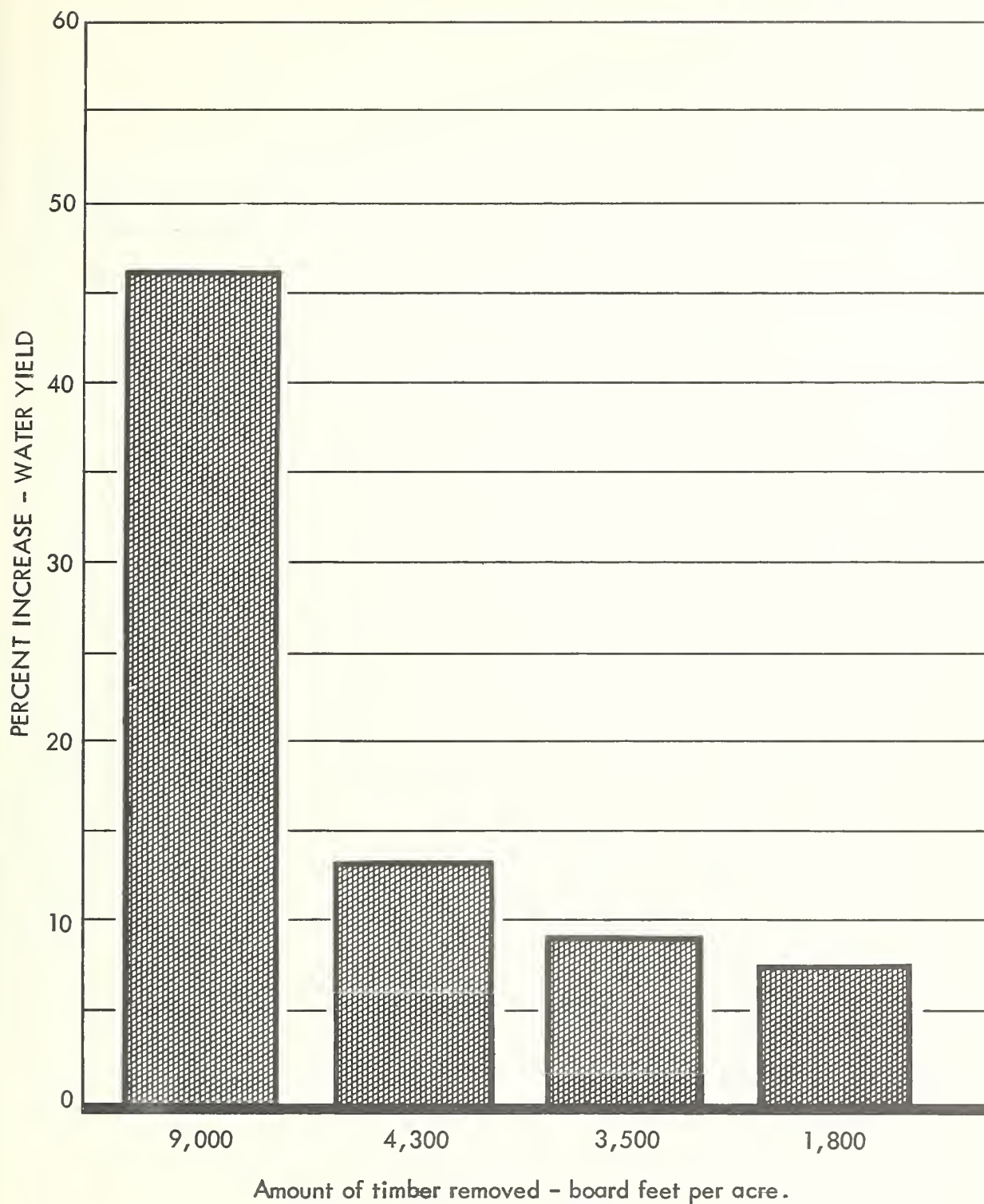
## Watershed Management Research

Pilot phase of soil surveys on National Forest land completed. A pilot program of soil surveys, initiated on the National Forests in fiscal year 1958, was completed in fiscal year 1962. This program was for the purpose of developing procedures for soil surveys on National Forest lands and testing their value in multiple-use resource planning and management. Surveys were made on 28 areas in all of the administrative regions of the Forest Service. Two technical soil survey reports have been completed and published as part of the Department of Agriculture soil survey series. Soil surveys have proven to be a valuable management tool. Survey procedures have been standardized and further surveys will now be carried on as a function of National Forest resource management.

Barley planting is good first aid for burned watersheds. Planting barley on closely spaced contours has proven to be the best "first aid" treatment on steep experimental watersheds in southern California, denuded by fire. Barley plantings were compared with other treatments such as large contour terraces, broadcast grass seeding, channel check dams and combinations of these on the San Dimas Experimental Forest, after fire swept the entire area in July 1960. Despite cold weather and low rainfall in the winter of 1960-61, the fall-planted barley was 2 inches tall in less than 2 weeks and formed a substantial barrier to overland flow and soil erosion, with increasing effectiveness as growth continued. A good seed crop produced an excellent volunteer stand the second year, giving at least two full years of valuable watershed protection. Moreover, barley plantings performed an additional service of protecting emergency terraces from breakage during large storms. The terraces failed in every watershed except where barley had been planted. Broadcast grass seedings generally were not successful, mainly because of bad weather. Channel check dams were effective in stabilizing the channel and in reducing storm flows and suspended sediment in the streams. After filling, the check dams were still effective in reducing rock and boulder movement in the channel.

Spacing of road drainage structures dependent on soil and slope characteristics of watershed. On the National Forests of the United States more than 4,000 miles of roads of all types are built each year, and probably as many more miles are built on private forest lands. Most of these lands are steep and rough, making road construction hazardous and difficult from the point of view of soil stabilization. In order to minimize the erosion from road construction, information is being collected which will serve as a basis for a practical guide for engineers and watershed managers. In determining the proper distance between cross-drain structures on road surfaces so as to keep erosion low, six natural characteristics of watersheds are significant. The most important factor is the proportion of large sized soil aggregates (greater than 2 mm.) in the surface inch of soil on the slopes where the road is constructed. Of nearly equal importance is the gradient of the road itself. Of lesser but still significant importance are surface soil aggregation in the road, aspect, ground cover on the cut slope and steepness of the terrain on which the road is built. Some of these factors can be controlled in construction processes; others can be alleviated by careful road location.

## Watershed Management Research



Average increases in water yield during the growing season resulting from removal of different amounts of timber from dense hardwood forest in Appalachian Mountains.





Experimental watershed in Rocky Mountains where removal of approximately half of merchantable coniferous timber by strip clear cutting resulted in 24 percent average increase in water yield over 5-year period following cutting.



Subsurface stormflow provides clues to flood control. Rainfall may infiltrate surface layers of soil but unless it percolates to deeper depths, it soon comes out as streamflow and may become a major factor in the occurrence of floods. On an experimental area in central Ohio, 50 to 90 percent of the simulated rain falling on the surface of a forested plot flowed out from the subsurface layers within four to six hours. Subsurface flow was most uniform from the 24-36-inch depth, ranging from 0.22 to 0.30 inch per hour, regardless of the intensity or duration of the artificial storm. Flow was only slightly less uniform from the 16- to 24-inch depth, whereas that from the upper 16 inches was erratic and varied with the intensity and amount of rainfall applied and the amount of water in the soil before the simulated rainfall was applied. When soil moisture was relatively low before rainfall, the greatest quantities of flow came from the deeper depths and little or no flow occurred from the intermediate depths. This means that the deepest depths overlying water-impeding layers must be wetted before flow will occur at the shallower levels, and that management of watersheds for flood control requires a vegetation cover that will readily utilize water in the soil and thus make space readily available for temporary storage of rainwater.

## Forest Recreation Research

Wilderness users in central Oregon are mostly home folks on a short visit. Studies of wilderness area users indicate that 91 percent of all 1961 visitors to the Three Sisters Wilderness area were Oregonians or out-of-staters accompanying Oregonians. Most of the visitors walked in; each group averaged 3 or 4 individuals. One-third of the visitors were under 16 years old, and of all visits, nearly 81 percent were made by persons who stayed for only one day.

Similar wilderness use was measured in the Boundary Waters Canoe Area in northern Minnesota. The number of visits per year was found to be considerably higher than had been estimated and the number is increasing rapidly. Total man days of use, however, is lower than previous estimates because the average length of stay is shorter. A large number of people stay on the area's fringes and enter it by day for fishing and sightseeing. Visitors are highly concentrated in some places, while other attractive areas are seldom visited. Except for a few of the very heavily used access points, people do not seem to object to overcrowding.

A circular slide rule for estimating the tolerance and durability of low vegetation was developed in southern Michigan. By inserting 3 variables-- (1) percentage of low-growing vegetation such as grasses and woody vines, (2) percentage of shade during the growing season, and (3) the weight of low vegetation in the absence of trampling--the slide rule appears to have practical application for predicting which of several low understory vegetation layers will be most durable to trampling in recreational areas.

Fertilization no help in reducing damage from trampling. A study in Pennsylvania seeking to reduce trampling damage showed that fertilization temporarily increased the volume of off-trail vegetation, but on heavily trampled areas fertilization was no help toward increasing the volume of vegetation.

Under heavy recreation use the more fertile sites in the Southern Appalachians are generally better able to withstand injury, insects and disease. Conifers were less resistant to mass recreation use than hardwoods. White pine was particularly susceptible to disease. Shortleaf pine and hemlock were the most resistant of the conifers. Hickory, persimmon, sycamore and white ash were the most resistant hardwoods. Rhododendron, mountain laurel, and the deciduous azaleas were quite resistant to the ravages of disease and insect infestation and withstood heavy, sustained use. Dense tree canopies seriously limit the growth of ground level species that protect the site. Canopy reduction will stimulate understory regrowth and decrease soil losses. Site deterioration, vegetation damage, reduced soil water intake and increased erosion are directly related to degree of use.

Rocky Mountain hunters prefer undeveloped campgrounds and no campfire. In 1961, only 9 percent of the hunters in 1791 camps studied in Colorado and Wyoming used specially developed hunter camps; 24 percent used existing campgrounds or picnic sites; the remaining 67 percent used undeveloped hunter camps. The majority of the campers were residents of the state in which they were camping. Three-fourths of the campers used tents. Length of stay averaged 5 days. The traditional campfire has less appeal to the hunter; 58 percent of the hunters used a wood or gasoline stove for both cooking and warming.



Consistent over-use of developed recreation sites often leads to destruction of the environment. How can this be prevented? Where it has occurred, how can the sites be rehabilitated?



How should areas be developed to provide maximum use without destroying the recreation environment? Lack of barriers and other controls are contributing to the deterioration of this site. Research is needed to answer such questions for proper planning of recreation developments and will be conducted in FY 1964 - especially in the northeast and California.



## Forest Protection Research

Current Activities: This work includes research on the prevention or control of damage from fires, insects, and diseases in forests and on related rangelands.

Research on forest fires is directed toward reducing fire losses, improving efficiency of fire prevention and control measures, and toward better techniques for using fire beneficially in forest and range management. Human attitude and behavior studies are laying the groundwork for improved fire prevention methods. Studies of thunderstorms and ways to reduce their fire-starting lightning discharges are continuing. How to predict fire behavior more reliably for better and safer fire fighting is being developed through intensive study of environmental factors that control the way fires burn. New chemicals and other additives to water that improve its fire fighting efficiency are being developed and tested. Also under study are fire effects and how to achieve best results from fire use for hazard reduction--including slash disposal, modification or control of vegetation, seed bed preparation and other purposes.

Research on forest insects is directed toward the prevention or control of destructive insect attack on forests and forest products. Damage by insects enters into all phases of forest management from the seed to the mature forest. The development of effective and economical methods of direct and indirect control is dependent upon thorough knowledge of life histories and habits of forest insects, including the interrelationships between the insects and their environments. Investigations on direct control methods involve mechanical and chemical methods. Research on improvement of insect survey methods with particular emphasis on use of aerial photographs is an important phase of the work. Control of forest insects by indirect methods such as the use of natural or introduced predators and diseases of insects, and by silvicultural practices designed to prevent the buildup of insect epidemics, offers promise and is being emphasized in the research program.

Research on diseases in forests, forest tree nurseries, and on decays and stains of forest products provides the basic information on the causes of diseases and on practicable and effective methods of combating them. Studies are underway on the identification and life history of the pathogens that cause disease, on the environmental conditions that result in disease epidemics in forests, on direct control by chemical and mechanical methods, on indirect control through silvicultural practices and genetic resistance, and on the improvement of disease survey techniques. In the products field, research is directed to the determination of methods of handling logs and lumber to prevent fungus infection; of the proper use of naturally durable or treated wood in high-hazard locations; and of improved structural design to reduce decay of wood in service.

## Selected Examples of Recent Progress

### Forest Fire Research

Laboratory studies. The Forest Service's second forest fire laboratory went into operation at Missoula, Montana in 1961. It greatly increased capabilities for studying forest fires and their behavior. The first laboratory, built by the State of Georgia at Macon, was completed in 1959. These laboratories are equipped with wind tunnels, combustion rooms and other facilities specially adapted to the study of fire and its control under a variety of environments. They now make it possible to derive basic principles of fire behavior and extinguishment and of other aspects of the fire problem, that previously could only be guessed at. Some of these findings have direct field applications; others provide the factual bases on which new progress can be made in adapting methods and systems to local needs.

Laboratory study this year produced new information on the flammability of forests in relation to their dryness. It had been suspected for some years that as forests dry out, their flammability increases faster than their dryness. Field experiments gave inconclusive information on this point. The principal reasons were the large number of varying factors that always enter into outdoor experiments and the difficulty of adequately sampling the moisture content of the forest fuel complex under typical weather conditions. Laboratory experiments with fires under controlled conditions to reduce the scatter of data and to test the full range of moisture content of the forest fuels, confirmed what had been suspected. Both rate of fire spread and fire intensity were found to vary as the reciprocal of the square root of the moisture content. This says in effect that flammability increases slowly with decreasing fuel moisture down to about 6 percent moisture content. As moisture decreases below this point, however, flammability increases more and more abruptly, approaching a virtually explosive burning condition. Quantitative information of this nature has immediate application in field practice, red-flagging those occasional days when the moisture in forest fuels drops to 5 percent or below.

Of practical significance too are studies of how forest fuels dry out. The rate at which different fuels give off or take up moisture proves to parallel very closely the rate at which they will burn. This demonstrates a close relationship between the drying process and the burning process, which can be very useful to the fire fighter.

In other experiments at these laboratories, scientists have produced tornado-like fire whirls which, on a larger scale, often cause forest fires to get completely out of hand and at times to threaten the lives of fire fighters. Conditions that lead to the formation of these whirls are being identified and measured under laboratory controlled conditions. This will give new insight and provide ways to identify forest and weather situations under which special measures should be taken to guard against these whirls in fire fighting. As in most natural phenomena, if the mystery can be removed from the fire whirl, most of its menace to life and forest values can also be removed.



More adequate knowledge of fire behavior factors must be developed so that the fire control specialist will be able to promptly identify the potential runaway fire and take the appropriate control action.



Much research needs to be done to develop fire fighting methods more adequately capable of controlling the more aggressive of these fires, at small size to reduce the area burned and the associated resource losses.



Weather and topography. Much of the unpredictable behavior of brush fires in California, such as was demonstrated in 1961, is due to the ebb and flow of marine and desert air with their opposing effects. Such air movements are complicated by rugged topography. Nevertheless, the results of intensive field studies now in progress give promise of increasing the understanding of these air movements to a point where they can be anticipated with confidence. This can greatly increase the efficiency of fire fighting effort and the safety of forest fire fighters.

Typical findings that affect the spread of brush fires are that in east-facing canyons in the coastal mountains of California, the daytime thermal up-canyon winds sometimes shift to strong down-canyon winds in early afternoon rather than at sunset. Similar shifts occur in the western foothills of the Sierra Nevada.

Along west-facing slopes of the coastal mountains marine air is in a shallow layer in the coastal lowlands at night, leaving much of the mountain slopes exposed to dry air. During the day, thermal winds aided by the sea breeze cause turbulent mixing that brings moist air to higher levels and often creates higher humidities on mountain slopes in spite of higher temperature. At night, as the air cools, downslope winds set in and marine air recedes to lower levels again. The "normal" pattern of rising humidity at night and falling humidity during the day is thus limited to lowland areas which remain in the marine layer.

Lightning studies. In Project Skyfire in Montana a series of randomized cloud seeding experiments are being carried out to determine the effect of overseeding with silver iodide on the occurrence of lightning. Techniques consist of heavy aerial seeding near the base of the cloud by means of an air-borne silver iodide generator. Preliminary analysis of two years' data indicates an apparent reduction of 38% in cloud-to-ground lightning from storms treated in this way. Further studies will be made to verify beneficial effects from cloud seeding.

Fire detection. Quick detection of wild fires is often the key to success in holding down forest fire losses. Lookout systems on the ground and aerial detection patrols are now the chief dependence. Both depend for success on the visibility of smoke from the fire. A new project to test air-borne infrared scanning devices has been organized in Montana to determine whether they can effectively supplement the human eye by detecting sources of heat in the terrain below. Shielding of the heat source by the forest canopy, interference from reflected thermal energy from the sun and other obstacles to infrared detection must be dealt with before the feasibility of enlisting the services of this device of modern technology in the service of forest fire fighting can be clearly determined.

## Forest Insect Research

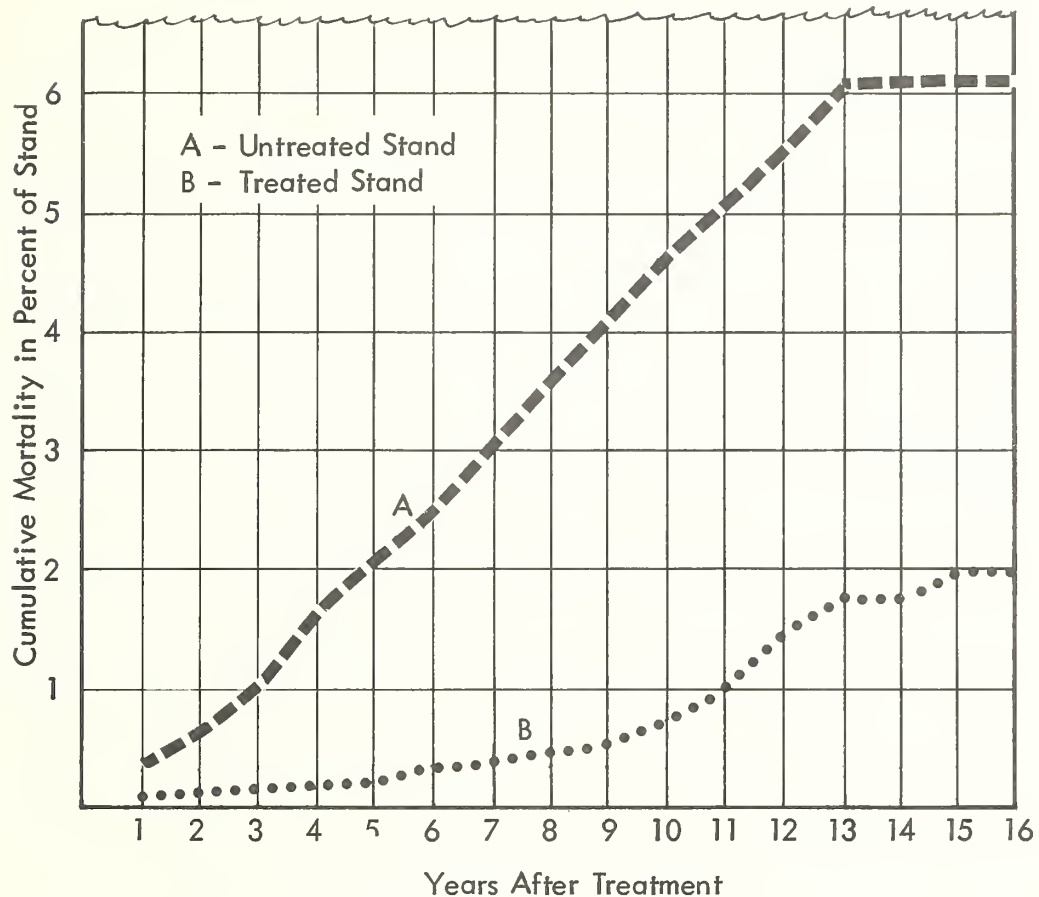
Habits of woodpecker enemies of the Engelmann spruce beetle. Recent studies in a high altitude spruce-fir forest in Colorado have thrown considerable light on the habits of woodpeckers, the most important natural enemies of the Engelmann spruce beetle. Three species of these birds occurred throughout the winter in beetle-infested stands; one of which remained in the area throughout the year; the other two migrated to lower elevations in the spring. During daylight hours in the winter the birds collected at beetle-infested trees; at night they dispersed to peripheral areas, up to one-half mile away. No large collections of birds were observed during the breeding season. As populations of Engelmann spruce beetles were depleted, the woodpeckers turned increasingly to other insects for their food supply. These woodpeckers are known to consume up to 98 percent of the overwintering beetle larvae in small outbreaks. In large outbreaks their effectiveness is much reduced because of their limited numbers. Information on their habits may make it possible to develop measures for increasing their numbers and improving their effectiveness in large outbreaks.

Sterilization of male gypsy moths by gamma irradiation. Recent research has shown that male gypsy moths can be sterilized by gamma irradiation from a Cobalt-60 source without crippling side effects, provided the proper dosage is applied at the right time. Studies so far indicate that best results are obtained by irradiating 9- to 11-day old male pupae with 20,000 roentgens. Further studies are needed to determine if the gypsy moth can be controlled through the mass release of sterilized males in infested stands.

Parasites of the gypsy moth. On the basis of recent findings it appears that several species of native parasites are much more effective in controlling the gypsy moth than has been suspected heretofore. This was indicated when it was determined in the laboratory that these parasites killed many more gypsy moths by stinging than by parasitization. Killing by stinging had not been recorded previously, and had not been taken into consideration in evaluating the effectiveness of the parasites in control of the gypsy moth. Further research is needed to fully evaluate these findings. It may be that previously-held ideas as to the full impact of parasites on the gypsy moth have been too conservative.

Preventive control of bark beetles. Losses from bark beetles have been reduced 80 percent by silvicultural measures. During the period from 1937 to 1951 old-growth ponderosa pines infested with bark beetles, or which were considered susceptible to attack at the time, were removed from stands on 859 acres at Blacks Mountain Experimental Forest, California. Each year since these trees were removed, the treated stands have been examined to determine the number of trees killed by bark beetles. So far, the average annual loss has been only 19.5 board feet per acre. In contrast, losses in nearby untreated stands have averaged 99.5 board feet per acre per year. In 1960, losses in treated stands were still only about half as great as in the untreated stands.

## Silvicultural Control



Silvicultural control offers promise as a safe, economical, and long-lasting method for forest pest control. The chart presents a comparison of losses caused by the western pine beetle in treated and untreated stands of ponderosa pine sawtimber during a 16-year period following treatments. In the treated stand, all trees shown by research to be highly susceptible to beetle attack were removed.



## NATURAL CONTROL

Natural control factors, such as insect parasites, affect in some degree all populations of forest insects. Studies in Oregon and Washington have shown that outbreaks of the spruce budworm are brought under natural control when aggregate parasitization of the budworm reaches 60 percent. In Oregon 35 species of primary parasites have been recorded on the spruce budworm; 12 are important.



Larva of Phytodietus fumiferanae (left) completing its development by killing a spruce budworm larva (X 3).

Immature larva of Phytodietus fumiferanae in characteristic feeding position on mature spruce budworm larva (X 3).



Maggot of Madreymia saundersii and spruce budworm pupa from which it issued to pupate in forest litter (X 5).



Parasitic fly, Madreymia saundersii whose egg develops into a maggot that feeds and develops inside the spruce budworm larva (X 12).



Fumigation control of European pine shoot moth. Fumigation of ornamental pines with methyl bromide provides a method of eradicating local infestations of European pine shoot moth. The European pine shoot moth, long a pest of pine plantations in eastern United States, recently was discovered infesting ornamental pines in the State of Washington, where it threatens invasion of the native ponderosa pine forests of the West. To curb this threat by means of State quarantines and eradication of local infestations, a safe and thoroughly effective method of treatment of infested trees is needed. The fumigation method, developed by research during the past year, meets this need.

Nematode parasites of bark beetles. Recent studies in the Southwest strongly suggest that parasitic nematodes are important factors in the control of bark beetle populations. For example, it has been shown that even though these organisms do not kill their hosts, they do reduce the egg laying capacities of infested female beetles, often by as much as 70 percent. Infested beetles have also been found to be less vigorous than non-infested ones. For example, they construct significantly shorter egg galleries than do the latter. Chances of nematode infestation of beetle progeny were found to be much greater when the female parent alone was infested than when the male parent alone was infested. Much additional research is needed in order to determine the actual role of nematodes in controlling or preventing destructive bark beetle outbreaks; and to determine conditions under which they operate most effectively.

Insect-caused defects in hardwood lumber. An important result of recent studies of insects causing defects in bottom-land hardwood lumber in the deep South was the finding that so-called bark-pocket defects are often caused by the feeding of sap beetles in the inner bark of living trees. In feeding on the sap at tree wounds these insects also chew into and destroy the adjacent inner bark, leaving scars which heal over to form the bark-pocket defect after the insects leave. At least 25 different species of sap beetles have been observed on bottom-land oaks. In the same area, a different kind of insect, the carpenterworm, damages oaks and other hardwoods by making large tunnels in the bark, sapwood, and heartwood of living trees. Degradation resulting from these tunnels and from associated stain and decay has been found to reduce the overall value of rough oak lumber by as much as 15 percent. Information on the biology and control of the carpenterworm was published during the past year.

Control of powder-post beetles. Studies in the South have demonstrated that it is possible to prevent Lyctus powder-post beetles from attacking and damaging rough hardwood lumber for several years. This can be done by dipping rough lumber in any one of several chemicals before storing it to air-dry, and prior to its manufacture into finished products. Wood dipped for periods as short as ten seconds in oil solutions containing specified amounts of DDT, chlordane, toxaphene, or gamma benzene hexachloride have remained free of attack for almost five years under conditions where attack on untreated wood was severe. Studies are being continued to determine how long the different treatments remain effective.

Systemics control the mimosa webworm. Recent studies show that this webworm, a pest not only of mimosa trees but also of honey locust, can be controlled through the use of systemics. Season-long protection of nursery-grown honey locusts was provided by a single application to the soil of granular

formulations of either Thimet or Di-syston. Following application of the granules, the soil is cultivated within 24 hours. The chemicals are absorbed by the roots and carried up the trees into the foliage where the webworm feeds. This method of control obviates the need for application of insecticides to the foliage of the trees, a technique that must be repeated from 3 to 5 times to provide season-long protection.

Silvicultural control of the red oak borer. Through recent research on this insect, a serious pest of various species of upland oaks in the Central States, it has been found that its abundance and the damage it causes can be reduced by proper timing of stand-improvement work. Studies have shown that the low quality trees most likely to be selected for poisoning and removal in improvement work are the same as those most likely to be heavily infested by the borer. Advantage is taken of knowledge recently obtained on the insect's life history and habits in determining when stand-improvement work should be undertaken so as to result in maximum reduction in its damage to the residual stand.

### Forest Disease Research

Genetic resistance to air pollution. Eastern white pine trees are susceptible to excessive needle injury, often culminating in death of the entire tree, caused by minute quantities of atmospheric ozone and industrial air pollutants. Research has not only proven the causal relation of the pollutants to the disease but has developed white pine trees immune or highly resistant to atmospheric toxins. This permits reforestation in polluted areas with trees that will not be injured by the toxins involved. Studies are in progress to determine the heritability of this resistance in seedling progeny of resistant trees.

Decay in air-conditioned wooden buildings is preventable. Moisture condensation in air-conditioned buildings occurs commonly, particularly in the hot humid areas of the South, and can lead to early and serious decay of wooden elements such as sill, joists, studs, and floors. It can be prevented by proper design, maintenance, and operation of buildings. Major requirements are to keep crawl spaces dry; use only daytime cooling if possible; with continuous cooling keep minimum temperature above 75° F; and if lower temperatures are essential, incorporate effective vapor barriers at time of construction.

Crash program to develop annosus root rot controls. Annosus root rot is widespread in pine stands throughout the East and South, particularly in thinned plantations on land previously cultivated. It has ruined some stands and threatens many more unless controls are developed. Direct measures under study include chemical treatment of stumps to prevent infection after thinning, thinning by poisoning rather than felling, and sanitation through duff removal. Indirect measures to lessen future hazards in plantations include wider spacing, species mixtures, and use of resistant species. Stump treatment and thinning by poisoning offer great immediate promise. Concurrently, long term research is underway to develop biological controls through the use of antibiotic soil organisms.



Annosus root rot losses in planted eastern white pine, preventable through the application of measures determined through research and now under large-scale field test.





Soil fumigation controls forest nursery diseases. Prior to the development through research of soil fumigation measures, the raising of seedlings was a touch and go business, with the season's results often no better than what is shown in the foreground of this photograph of a southeastern nursery. Contrast the thin stand of puny trees in the foreground with the vigorous seedlings beyond that are growing thickly in soil fumigated with anti-root-rot chemicals.



Fungal components in mycorrhizae isolated. In some soils trees cannot grow satisfactorily in the absence of mycorrhizae, which are microscopic root structures composed of host and fungus tissues. Inability to easily and quickly isolate the fungal component from mycorrhizae has been a limiting factor in research to determine their exact role in tree nutrition and disease susceptibility. This stumbling block has now been removed, thereby permitting the isolation of many different fungi from mycorrhizae on the roots of southern pines and their use to produce synthetic mycorrhizae on seedlings in pure culture. Assays are in progress to determine the possible antagonism of these fungi to the pathogens associated with littleleaf disease and annosus root rot, two of the most damaging diseases of southern pines. A new tool, as essential as the microscope, has been provided for our scientists in their search for new and better ways of growing disease-free forests.

Growth impact of dwarfmistletoe measured. Dwarfmistletoes are abundant and widespread in many stands of western conifers. Since their effect on tree growth is slow and hardly noticeable during short intervals, many land managers have questioned the economic feasibility of applying known control methods. In 100-year-old lodgepole pine stands in Colorado, typical of stands over millions of acres in the West, healthy stands had an average merchantable volume of 2,300 cubic feet of wood per acre but comparable stands infected with dwarfmistletoe for 70 years averaged only 300 cubic feet per acre. Over a 100 year rotation, dwarfmistletoes caused a growth reduction of 20 cubic feet per acre per year. Similar studies are in progress in ponderosa pine stands, coupled with an analysis of the economics of control in stands varying in age, site quality, and infection intensity.

Guides for marking white fir developed. The Indian paint fungus causes three-quarters of the decay losses in white fir in Oregon, and produces conks on five-sixths of the infected trees. With this information marking rules were developed that take the guess out of cruise estimates and permit a much more accurate estimation of the merchantable volume on timber sales.

## Forest Products and Engineering Research

Current Activities: This work includes forest products utilization research and forest engineering research.

Forest Products Utilization Research. The aim of the forest products research program centered at the Forest Products Laboratory and with field projects at the various regional Forest and Range Experiment Stations is to contribute to the solution of national, regional, and local utilization problems of all types; to reduce unused woods and mill residues to a minimum by finding uses for present residues; to develop new products; and to improve the serviceability and lower the costs of existing products. Its broad aim, in brief, is to develop new utilization outlets for thinnings, unpopular and little used species of timber, logging and milling residues, and to make the whole timber crop on farms and other forest lands go further and give better service in a wide variety of uses for lumber, paper, chemicals, and other products derived from wood.

Forest Engineering Research. The aim of the forest engineering research program is to advance the efficiency and mechanization of forestry operations. The application of sound engineering principles to timber production requires research into each operational phase in managing, harvesting, and renewing forests, and the mechanization of each phase. Emphasis is placed on study of logging equipment, new logging methods such as by helicopter, log handling processes, and methods of processing to upgrade the quality of products. Forestry engineering research also includes studies of mechanization to improve forest range practices; fire, insect, and disease control; and better methods of watershed management.

### Selected Examples of Recent Progress

#### Forest Products Utilization Research

Forest Products Laboratory reorganized. To effect economies and improve efficiency, the organization of the Forest Products Laboratory at Madison, Wisconsin was revised on August 1, 1962. The previous seven research divisions were reduced to five, and all supporting activities consolidated into one Laboratory Management group. The new organization brings about a closer association of related research activities in light of current research needs, and increases the time scientists may spend on research by reducing administrative duties.

Stiffening and stabilizing paper. Successful commercial application of a Forest Products Laboratory-developed principle was achieved in some member mills of the Boxboard Research and Development Association even before completion of the cooperative research study that showed its potentials. The Laboratory demonstrated that the wet web on a papermaking machine can be stretched with curved expander rolls so that the final dried sheet is actually wider than the wet pulp mat, instead of being narrower due to shrinkage as is the usual process. Not only is the paper area increased, but papers are significantly stiffer and stronger, and are more dimensionally stable with changes in relative humidity. This is believed to be the first time such results have been accomplished anywhere. Although strength and stiffness are important in many applications, improved dimensional stability



Basic engineering principles developed by the Forest Products Laboratory make possible safe and economical structural uses of wood.



also is urgently needed where dimensional changes cause serious production and operating troubles, as with punchcards, maps, charts, and paper for color printing.

High-quality bond paper from sawdust. Paper identical to high-quality conventional paper that sells for about \$200 a ton can be made from sawdust. Pulp mills now use some sawdust in mixture with larger wood chips but cannot produce pulp solely from ordinary fine sawdust. The Forest Products Laboratory has manufactured high-quality writing paper from 100 percent sawdust that was produced with a saw having only slightly larger width and bite than the size ordinarily used to cut softwoods. The research proved that increasing the sawdust particle size eliminates the need to mix the sawdust with larger chips. This work may stimulate further commercial development of special saws to produce usable sawdust while still producing acceptably smooth board surfaces.

Upgrading low-quality raw materials. While the lumber industry as a whole is experiencing a soft market, the producers of ponderosa pine in Arizona and New Mexico face the added problem of trying to find markets for a product that is predominantly of low quality. In cooperation with industry, a broad array of special studies are now being undertaken to evaluate and demonstrate the feasibility of using low-grade material in products such as veneer and plywood, lumber core flooring, overlaid lumber products, particle board of several types, or laminated timbers. The problem of utilizing low-grade lumber is by no means unique to the Southwest. For instance, a large, new lumber conversion mill at Biddeford, Maine is being constructed to manufacture clear end- and edge-jointed white pine boards from low-grade (No. 4 Common) lumber. This enterprise resulted from a special study by the Forest Products Laboratory to determine whether it would be practical to apply principles similar to those used in grading hardwood lumber to low-grade white pine. Hardwood boards are graded not on the basis of overall appearance but on the yield of cuttings of wood clear of knots and other utility-reducing imperfections. This approach to softwood grading was found to be practical. The data obtained from the grading study showed a good potential for a commercial operation designed to produce high value products from low-grade white pine.

Paintability of southern pine. The difficulties often experienced in maintaining a satisfactory painted surface on flat-grain southern yellow pine may soon be eliminated. Studies by the Forest Products Laboratory indicate that a finishing system using an oil primer and two polyvinyl acetate emulsion top coats gave weathering performance superior to that obtained with four different oil-paint systems. The research included exposure for 6 years to both northern and southern climates.

Cost of military packaging reduced. Air Force savings on procurement contracts in one 10-month period were reportedly about \$2-1/4 million as a result of using a new Packaging Cost Manual prepared by the Forest Products Laboratory. According to a West Coast packaging consultant, \$247,000 was refunded to the Air Force on just one contract on which he had used the cost manual. Because of these impressive savings by the Air Force, the Navy and the Army Ordnance Corps are also trying out the manual. Furthermore, the Laboratory has assisted the Joint Military Packaging School in the preparation of a training course to expedite the early adoption of the principles involved.

Basic research emphasized. As shown in the examples above, applied research has provided practical and usable answers to some of the most urgent problems in forest products utilization. However, a real breakthrough cannot be expected in some difficult areas without greatly intensified basic research. Such research has therefore been strengthened, including examples in fields such as these:

Lignin structure. A better basis for attack on the problem of lignin use is furnished by new evidence that biphenyl-linked building units account for about 30 percent of the lignin molecule. Lignin, the binding material in wood, comprises about one-third of wood substance. Although available as a high-tonnage by-product of pulp and paper production, wide-scale use of lignin has never been achieved. For many years strong emphasis has been put on attempts to characterize completely the chemical structure of lignin without too much apparent success. Nevertheless, this past research has provided a vast body of knowledge that can now be more effectively utilized because of the development of powerful new research tools and concepts. For example, radically new techniques of lignin isolation by use of hydrofluoric acid have proved so successful that concurrent basic research with the electron microscope has now established a previously unrecognized pattern of lignin distribution in wood cells. This gives new avenues for developing better pulping processes and for treating wood with preservative or fire-retardant chemicals.

Efficient structural utilization of wood. The increasing competition faced by wood industries demands that sound basic engineering information be available to permit the most efficient possible structural utilization. Substantial data have been accumulated over the years on strength and related properties of wood, but their adequacy and reliability in light of present-day needs is open to question. Comprehensive studies of strength properties are time consuming as well as costly; therefore, a new concept has been devised to establish the reliability of available design information and the need for additional data in certain areas. Strength and density of wood are well correlated, but density and other physical characteristics have also formerly been evaluated on a sporadic and more or less haphazard basis due to the tremendous variations that exist in geography, elevation, aspect, climatic conditions, and the like, within the range of a species. A basic approach undertaken within the past few years is now paying off in supplying, for the first time, statistically reliable estimates of variability in specific gravity in entire states and over entire ranges of the most important commercial species.

The highly useful results available upon completion of the "quality census" in Mississippi led to similar studies in Alabama, Arkansas, Florida, Georgia, Missouri, and North Carolina in the south; in Maine in the northeast; and the several western states--Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming. The extensive sample collection in the western states, now nearly two-thirds completed, is in cooperation with the Douglas-Fir Plywood Association, the West Coast Lumbermen's Association, and the Western Pine Association who, recognizing the wisdom of this statistically sound basic approach, are making substantial contributions of funds to speed up the work. These western studies are designed so as to bring out and remedy deficiencies in basic strength data that will provide the foundation necessary for sound strength design values for wood.

Termite attractant. A new possibility of termite control has been found. Basic research has disclosed that a certain decay fungus produces a substance that is a powerful attractant to termites. Placed in wood, it consistently lured termites to specific locations. This material may eventually prove useful in locating termite infestations and, if coupled with an insecticide, in controlling the wood-devouring pests.

## Forest Engineering Research

This program is a new approach to advancing the efficiency and performance of forestry operations. Entire systems of operations are studied to determine how the various elements can be improved, adjusted, and timed to obtain the maximum overall efficiency. The application of sound engineering principles to timber production, for example, requires research into each operational phase in managing, harvesting and transport, renewing and protection of forests, and the mechanization of each phase. Engineering problem analyses have been undertaken in three of seven major forestry problem areas. Concurrently, detailed investigations have been made in two transportation methods revolutionary in the forestry field--helicopter harvesting and pipeline movement of wood chips.

Helicopter logging. There is an urgent need to develop logging methods which are more compatible with soil, water and recreation resources, and which reduce requirements for costly road construction and maintenance. With the advent of helicopters having lifting capacities up to 20,000 pounds, research was begun to determine the factors affecting the feasibility of helicopter logging in the Pacific Northwest and Alaska. These studies show that the helicopter has a definite role to play in improved logging systems provided factors can be made favorable to the particular capabilities of the helicopter. Studies are now underway to design logging systems and accessory equipment required to optimize helicopter use in logging. It is almost certain that the helicopter will become a useful part of logging systems.

Pipeline transport of wood chips. Research completed on the hydraulics of pumping wood chip and water mixtures through pipelines indicated this method can effect great savings in transport costs of raw materials for pulp and chemical conversion plants. There is sufficient promise in this transport method to justify additional studies now begun on the special techniques and factors involved in feeding, controlling, and unloading such pipelines.



Vastly improved logging systems are needed to protect steep forest watersheds where timber harvesting, slash burning, and road building combine to damage soil values severely.



## Forest Resources Research

Current Activities: This work includes the nationwide forest survey, research relating to the marketing of timber products, and investigations of the economics of timber production.

Forest Survey. The nationwide forest survey provides basic forest resource facts by States or counties on the character and condition of forest land; the volume, quality, and location of standing timber; rates of timber growth and natural losses; the amount and kind of timber cut for forest products; and national consumption and prospective requirements for timber products. This information provides a basis for policies and action programs of public forestry agencies, forest industries, landowners, and many others having direct interests in forest resources.

Forest Economics Research. Investigations of the economic aspects of forestry enterprises provide information on the profitability of producing various timber crops in different areas, the effect of ownership, taxation, and other economic factors on the practice of forestry, and possible means of reducing financial and economic obstacles to the growing and harvesting of forest crops. These studies thus provide economic guidelines for forest owners and timber industries, and in conjunction with other resource investigations furnish part of the facts needed for development of national and local forestry programs.

Forest Products Marketing. Research in the marketing of forest products includes studies to increase the efficiency of harvesting, grading, selling, and distributing forest products, improved methods for providing price and market information for timber products, and development of expanded markets for timber species and materials in surplus supply. Such marketing investigations are of particular importance to the several million owners of farms and other small forest properties.

## Selected Examples of Recent Progress

### Forest Survey

Resource trends vary among States. Knowledge of trends as well as of current volume and characteristics of our timber resources, provided by the forest survey, help guide formulation of public and private forestry programs. The area of commercial forest land generally is increasing although at a slower rate than a decade ago. In the five Southeastern States, for example, forest area increased 2 percent during the 1950's compared to 4 percent during the previous decade. One of several exceptions to the general trend was in Florida where commercial forest area declined about 9 percent between 1950 and 1960, due largely to conversion of cleared forest land to improved pasture. Most recent surveys show increases in total volume of timber, but decreases in quality. In the Southeast, for example, the volume of all pine timber increased 2 percent during the 1950's while the volume of pine sawtimber declined 3 percent. This trend is even more striking in Florida where, during 1935-59, the volume of quality pine sawtimber with diameters 15 inches or larger declined 50 percent, while the volume of all pine growing stock decreased only 2 percent. In Arkansas,

in contrast to the general trend, the volume of softwood sawtimber increased 40 percent from 1951 to 1959. Hardwood sawtimber volume, however, declined nearly 20 percent during the same period.

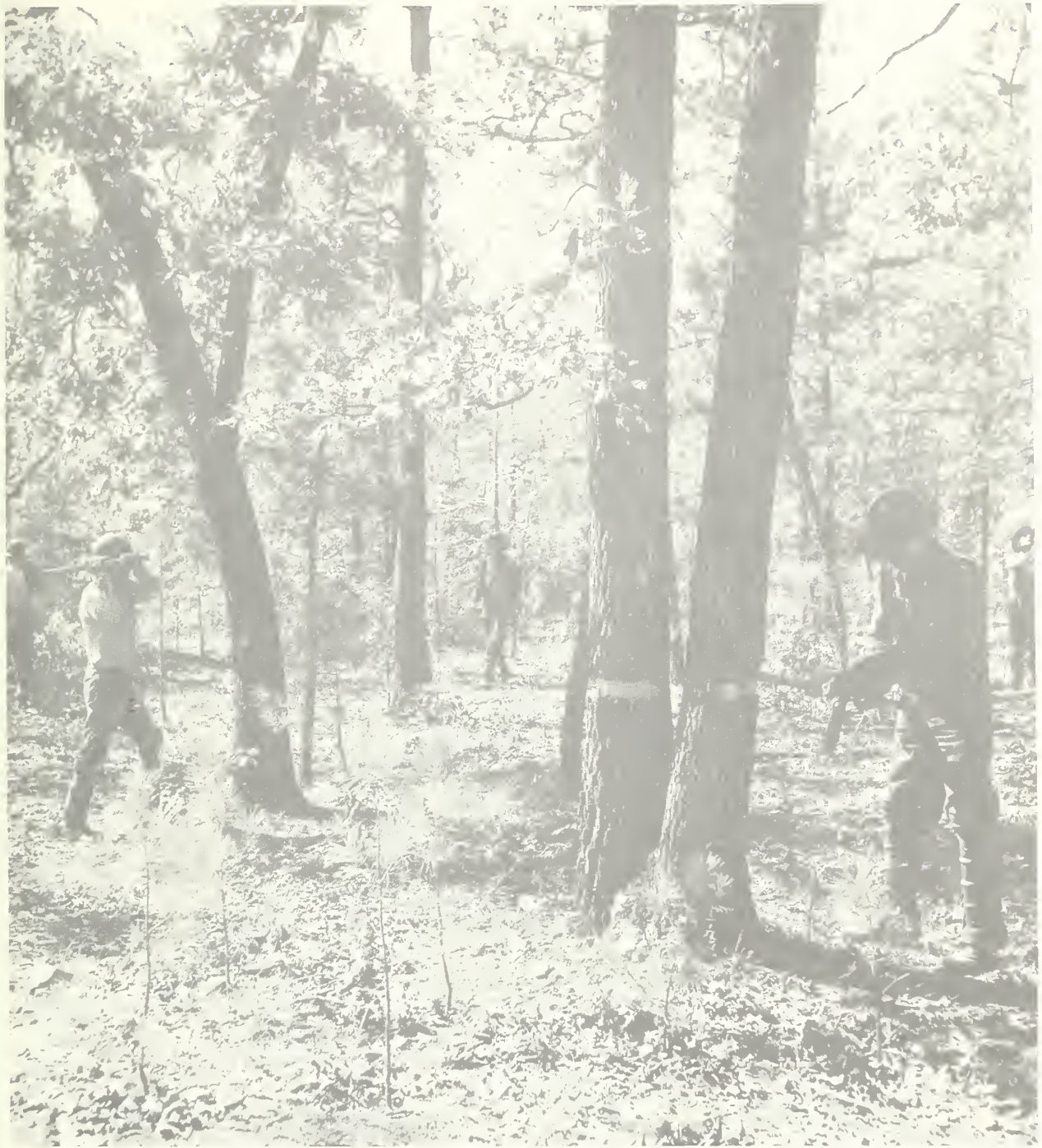
Wisconsin's timber resources show mixed trends. As an example of more detailed Survey findings in a single State, comparisons of data from the recent resurvey of Wisconsin with those from the first 1936 survey show both favorable and unfavorable trends. Forest lands are now better stocked, stand volumes are greater, and both growth and allowable cut are significantly larger than in 1936. Good forest management is practiced on more areas and fire losses have been greatly reduced. On the other hand, the acreage of desirable conifer stands is still less than 14 percent of the forest land. More than a million acres of forest land are nonstocked or poorly stocked. Much growing space is occupied by cull trees, and sawtimber trees average smaller in size and volume, especially the more desirable sugar maple and yellow birch. The cut of softwood species exceeds the allowable cut in most areas, particularly in central Wisconsin.

Aerial film types tested. Studies of films used in aerial surveys showed that significantly better photo interpretation of tree species could be accomplished on color film than on panchromatic photographs. Identifications of species made by several photo interpreters were more accurate and more consistent with color photographs. Guides for photo classification of several kinds of two-story stands in the Douglas-fir subregion also were developed in the forms of a series of stereograms. These guides not only expedite the mapping of such stands on a consistent basis, but also provide graphic definitions of forest maps in that region. Results of another study indicated that aerial photographs of medium scale (1: 12,000) were generally as satisfactory as larger, more expensive scales for mapping and sales layouts required under unit area control management of ponderosa pine forests.

#### Forest Economics Research

Timber stand improvement returns in Rocky Mountains. A study in the northern Rocky Mountain region showed that with present cost and value levels each dollar spent in thinning will produce an estimated \$4 to \$45 in added yields by rotation age, while each dollar spent in pruning will produce \$9 to \$40 of extra value. The most valuable species on the best sites promise to return rates of interest that are currently thought to be reasonable for long-term investment.

Watershed management in the Southwest. The effects of various watershed treatments on timber, forage and other resources yields are being evaluated on the Beaver Creek project in Arizona. Stream gauges have been installed in 17 sub-watersheds of a 275,000-acre pilot area. Treatments to date include complete removal of pine and other trees from a 150-acre sub-watershed in the ponderosa pine type and reseeding to grass at a cost of \$95 per acre. More than 6,000 acres of pine have been treated by thinning and other timber stand improvement measures at costs from \$12 to \$27 per acre. More than 16,000 acres of pinyon-juniper stands have been cleared and planted to grass at about \$13 per acre. Expanded and additional treatments will be applied as additional watersheds are



Forest economics research determines costs and benefits that may be expected from different timber growing and harvesting activities to help guide investments in forestry.



adequately calibrated. Preliminary results on treatment costs, and effects of treatment on water, timber, forage and other resources yields are already providing helpful guides for management of large land areas in the critical watersheds of the Southwest.

Factors motivating small woodland owners. Results of recent studies of small woodland owners emphasize the importance of fully analyzing all physical, economic, and social factors before proposing or implementing forestry aid and assistance programs in a local area. In the Upper Peninsula of Michigan, for example, absentee owners who hold land primarily for recreation use are becoming increasingly important, while in southern Michigan wage earners, business and professional people and other nonfarmer groups together represent the largest part of the small owner population. Urban expansion in southern Michigan has changed forest use and widely influenced ownership expectations and land use plans. Such factors must be considered in developing programs intended to promote better forest management among private owners.

### Forest Products Marketing Research

Remanufacturing increases returns. A study of 50 eastern Kentucky lumber producers has shown how additional plant investments and processing beyond rough green lumber increases product value, labor force required, and returns to the community. For example, two plants each using 2-million board feet of timber annually show the following financial comparison:

<u>Plant costs and returns</u>	<u>Plant producing rough lumber only</u> (Dollars)	<u>Plant doing further processing</u> (Dollars)
Expenditures		
Stumpage purchases	35,200	35,200
Payroll	44,500	102,900
Equipment	11,200	41,800
Power	6,000	13,000
Other	<u>7,600</u>	<u>17,000</u>
Total	104,500	209,900
Receipts	123,900	259,600
Margin	19,400	49,700

Such information has been requested from many sources in connection with area redevelopment programs.

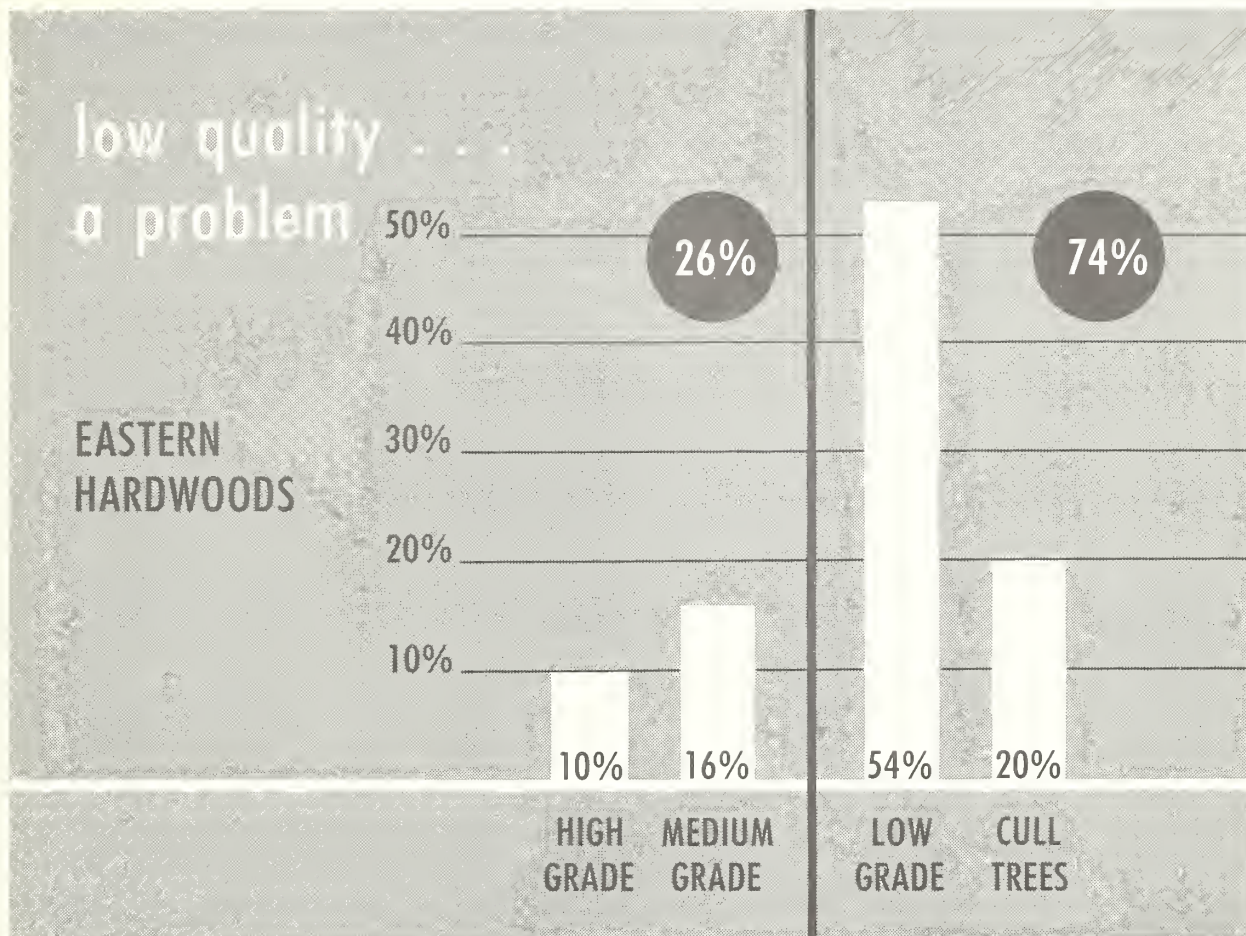
Price structure of southern pine lumber changing. Shifting market demands have altered the price structure of southern pine lumber. In the last 10 years wholesale prices for B and Better southern pine lumber have dropped almost 20 percent while prices of dimension and structural timbers have risen somewhat. For many manufacturers lower price for B and Better lumber have intensified the profit squeeze caused by rising wages and other costs, and have induced operators to improve mills and to increase output of 2-inch lumber. The changing price structure also has reduced somewhat the relative value of upper-grade sawlogs and high-quality stumpage.

Forestry industry prospects in West Virginia. Establishment or expansion of wood-using plants in the Beckley-Hinton area of southern West Virginia appears promising, according to a preliminary report on timber marketing prospects in West Virginia. There is a sizeable and increasing wood supply of relatively good quality, water supplies are adequate for moderate-size pulp mills, industrial sites and utilities are readily available, and local financial assistance is available under a new Industrial Development Authority.



Marketing studies of wood consumption and of potential future demands for forest products provide bases for appraisals of the adequacy of timber supplies and of forestry programs.





Three-fourths of our eastern hardwood timber is of low quality. One primary goal of marketing research is development of new or expanded industries based on such timber, especially in low-income rural areas in need of economic development.



Forest Research Construction

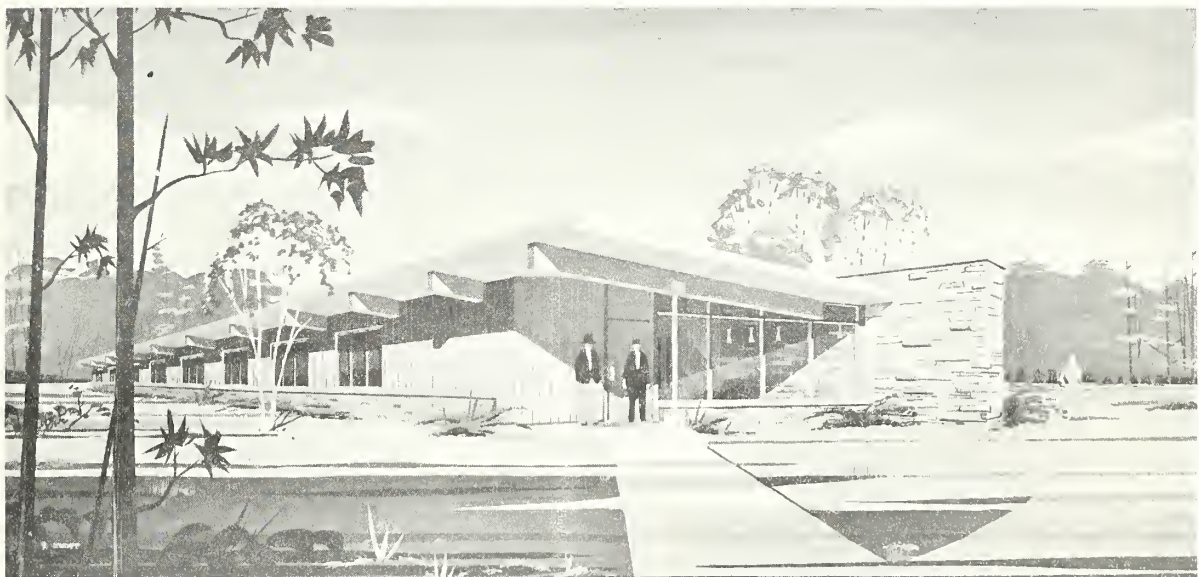
The 16 laboratory construction projects authorized by the Congress for fiscal year 1962 are all either completed or in process of being built. The larger structures should be finished and ready for occupancy by spring or early summer of 1963.

Architectural and engineering work is proceeding on schedule for laboratories financed for fiscal year 1963 as follows: Tempe, Arizona; Logan, Utah; Parsons, West Virginia; Warren, Pennsylvania; and Alexandria, Louisiana. Construction contracts for these five buildings will probably be awarded in April or May 1963. Architectural and engineering planning for the wood chemistry and pulp and paper laboratory at the Forest Products Laboratory at Madison, Wisconsin is also underway.





Lake States Forest Experiment Station - Headquarters Laboratory  
St. Paul, Minnesota



Lake States Forest Experiment Station - Northern Hardwoods Laboratory  
Marquette, Michigan



## STATE AND PRIVATE FORESTRY COOPERATION

Current Activities: This program, for the most part carried on in cooperation with the States, encourages private timber growing through assistance in preventing and suppressing forest fires, reforestation of denuded and poorly stocked areas, and good management of woodlands. Privately-owned forest lands comprise three-fourths of the Nation's commercial forest area and produce 85 percent of all timber cut. The fire control program applies to all State and private forest lands within the boundaries of organized protection units. The balance of the program is concentrated on small forest properties in private ownership because (a) more than half of the commercial forest acreage is in small holdings averaging only about 60 acres each, (b) the small-owner group comprises 99 percent of private forest owners, and (c) present cutting practices are poorest on these small properties.

### Selected Examples of Recent Progress

#### Cooperative Forest Fire Control

During 1961 Kansas entered the Cooperative Forest Fire Control program. There are now 49 States in which the Federal Government is cooperating in forest fire control under the Clarke-McNary Act. They protect more than 412 million acres of forest and non-forested watershed lands. Arizona, now considering initiating a program, is the only State not participating.

During the year fire protection was extended to an additional 10 million acres of non-Federal forest and watershed lands not previously receiving organized protection. Some of this acreage was not included in the 1957 area and cost study. The unprotected area is 30 million acres.

Fire losses were greatly reduced in 1961. There were 7 percent fewer fires and 40 percent less acreage burned on protected areas than the previous year.

The Federal contribution to the cooperative fire program was increased substantially for fiscal year 1962. An additional \$2,345,000 Federal funds were made available, making a total allotment of \$12,465,500. State and private expenditures also were increased. Total expenditures for fiscal year 1962, including Federal funds, are estimated to be over \$62 million.

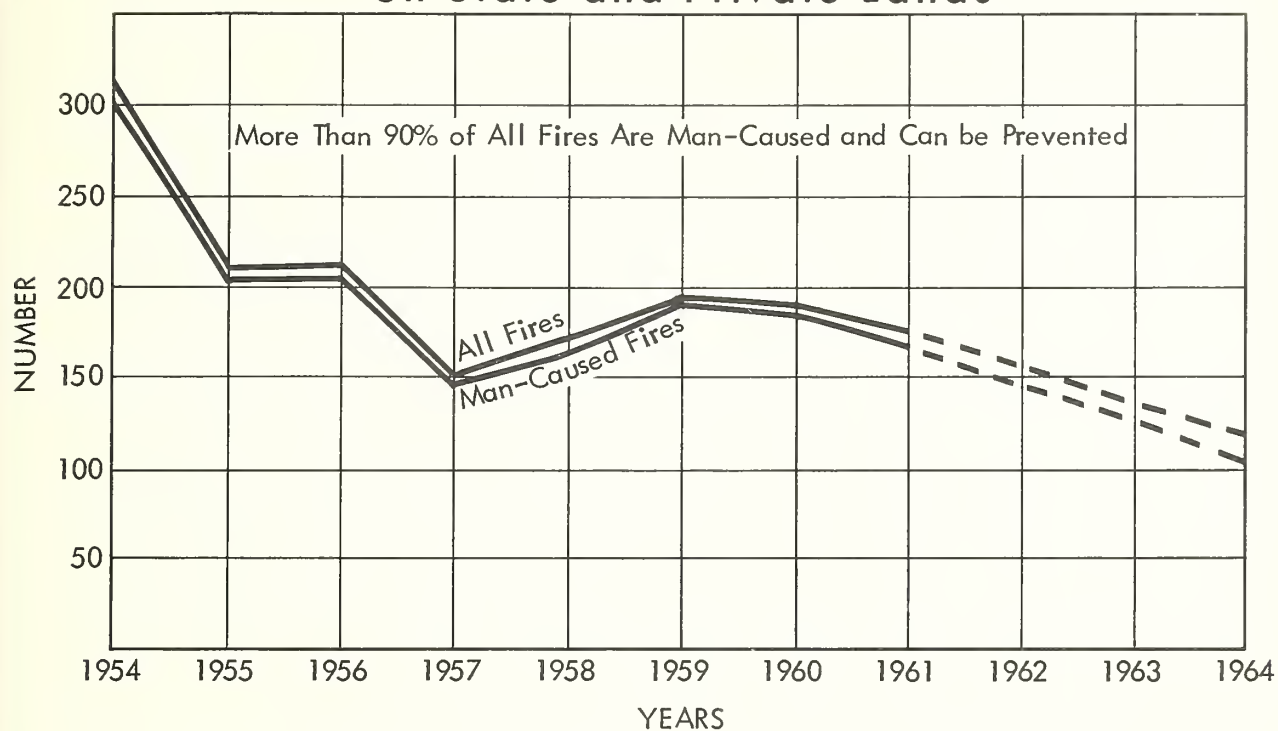
A new fire report form has been developed and placed in use this year as a major step to obtain more realistic data on fire expense and damage.

Initial action was taken during the year to update the nationwide estimates for cost of adequate fire protection on non-Federal lands. The study will be completed in 1965. The last estimate was made in 1957.

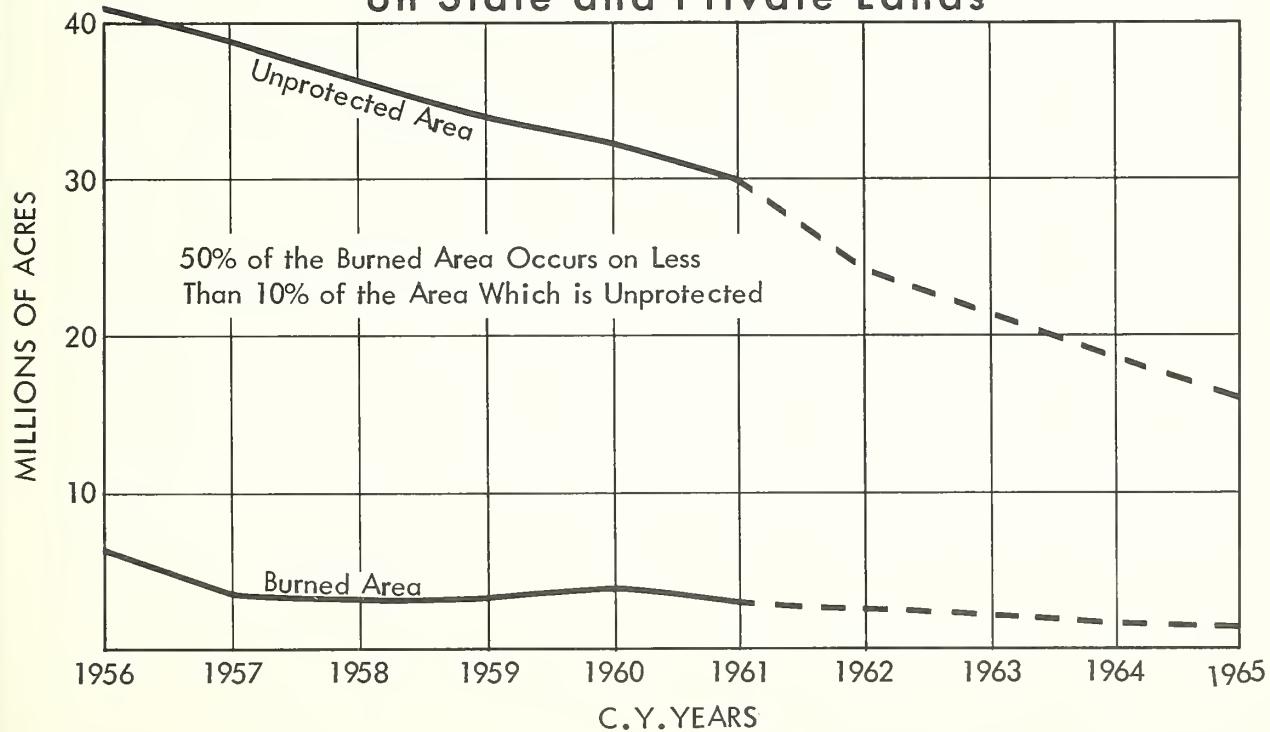
Continued progress was made in Rural Fire Defense activities. Several publications were developed for strengthening the program in rural areas.

The following table shows fiscal year 1963 Federal allotments to States, and the total fiscal year 1961 and 1962 expenditures for cooperation in forest fire control on non-Federal lands.

## Number of Fires Per Million Acres Protected on State and Private Lands



## Cooperative Forest Fire Control on State and Private Lands







Fires such as these destroy forest resources on lands of about 4-1/2 million private owners. These people look to the State forestry agencies to protect their lands which produce 85% of the Nation's timber, and billions of dollars of water, recreation, and other resource values.



Fire suppression is costly and hazardous work. In addition to the resource loss, local industries frequently suffer due to the necessity of diverting vital manpower to fire suppression work.



	State and Private Funds Expended F.Y. 1961	State and Private Funds Expended F.Y. 1962	Federal Allotments F.Y. 1963 <u>1/</u>
Alabama .....	\$1,189,800	\$1,100,582	\$ 403,400
Alaska .....	28,758	54,937	47,000
Arkansas .....	883,578	1,096,029	349,800
California .....	14,492,067	16,460,329	1,152,300
Colorado .....	123,203	198,022	47,000
Connecticut .....	154,673	181,922	57,500
Delaware .....	11,158	12,866	15,500
Florida .....	3,130,903	3,259,887	582,500
Georgia .....	2,687,626	3,029,606	563,200
Hawaii .....	20,699	29,552	25,000
Idaho .....	413,384	503,145	196,500
Illinois .....	186,241	122,819	70,500
Indiana .....	70,135	76,064	53,700
Iowa .....	49,049	52,902	47,000
Kansas .....	- -	3,347	5,000
Kentucky .....	646,090	766,393	226,900
Louisiana .....	1,723,511	1,896,494	460,300
Maine .....	1,141,736	1,470,675	326,200
Maryland .....	524,111	475,020	155,200
Massachusetts .....	407,914	412,308	132,800
Michigan .....	1,939,554	1,924,770	485,200
Minnesota .....	625,455	559,722	313,800
Mississippi .....	1,808,744	1,389,387	474,200
Missouri .....	758,067	794,468	268,900
Montana .....	540,436	319,436	142,200
Nebraska .....	8,287	10,771	9,000
Nevada .....	180,550	170,394	49,400
New Hampshire .....	178,233	182,573	88,200
New Jersey .....	409,852	408,343	134,800
New Mexico .....	82,376	61,317	47,000
New York .....	853,953	745,108	300,200
North Carolina .....	1,281,293	1,663,145	421,900
North Dakota .....	6,165	7,521	14,000
Ohio .....	316,456	312,365	123,100
Oklahoma .....	260,375	201,825	174,900
Oregon .....	2,893,475	2,869,997	559,400
Pennsylvania .....	757,330	822,386	246,300
Rhode Island .....	132,582	124,920	47,000
South Carolina .....	1,293,308	1,262,346	391,800
South Dakota .....	46,945	51,406	47,000
Tennessee .....	912,663	1,030,971	336,800
Texas .....	960,753	799,860	350,300
Utah .....	53,438	87,373	47,000
Vermont .....	56,382	47,431	47,000
Virginia .....	1,063,972	1,050,045	358,300
Washington .....	2,941,829	3,037,842	557,300
West Virginia .....	324,561	421,164	161,600
Wisconsin .....	1,747,686	1,575,450	439,100
Wyoming .....	22,618	27,477	47,000
Administration, Inspection, Prevention, and Special Services to States ...			865,500
GRAND TOTALS .....	50,341,974	53,162,712	12,465,500

1/ While the amount available to a State may, if the allotment is small, exceed previous expenditures by that State, the actual payment to a State never exceeds State and private funds expended by or under the control of the State.

### Cooperative Forest Tree Planting

The work authorized by Section 4 of the Clarke-McNary Act in the furnishing of forest and shelterbelt planting stock for use on non-Federal land continued in fiscal year 1962 to be an important activity. Forty-five State Foresters, three State colleges and the Commonwealth Forester for Puerto Rico cooperated in this work under agreements with the Department of Agriculture.

The number of trees shipped to landowners during each of the past five fiscal years in comparison with all forest and shelterbelt trees produced by public and private nurseries is as follows:

<u>Year</u>	<u>State Cooperative Program</u>	<u>Other State Distributions</u>	<u>Total Output All Nurseries</u>
1958	764,364,000	377,274,000	1,554,692,000
1959	945,464,000	630,766,000	2,080,122,000
1960	844,599,000	522,830,000	1,918,746,000
1961	774,159,000	248,186,000	1,537,558,000
1962	670,000,000	28,000,000	1,100,000,000

The State and other nurserymen over the past several years have been increasing their efforts to improve the quality of their planting stock. This effort in recent years in particular includes improvements in the form, growth rate and other characteristics of the trees from which the tree seed is obtained. A significant number and acreage of seed production areas and seed orchards are being developed or planned for development throughout the country for this purpose. This effort should result eventually in improved timber stands.



A State tree nursery operating under the State-Federal cooperating program.





Lack of seed trees, fire, and improper land use have prevented natural re-seeding of this land. State nurseries must provide sufficient planting stock so that such lands can be replanted and restored to full resource productivity.



Cooperative Forest Management and Processing

The following tabulation shows the accomplishments in Cooperative Forest Management and Processing for the fiscal year 1962:

Activity	Unit	Accomplishment
Owners given woodland management assistance ...	Number	91,418
Area receiving management assistance .....	Acres	4,797,106
Timber products sold or harvested .....	M.B.F. <u>a/</u>	547,787
Value of timber products sold or harvested ....	Dollars	12,344,342
Young timber saved from premature harvest .....	Acres	189,241
Owners referred to consulting foresters for additional assistance .....	Number	1,509
Area involved in above referral .....	Acres	502,618

a/ Thousand board feet.

This program includes all the States except Arizona. In fiscal year 1962 there were 638 "service" or farm foresters. The States contributed \$3,034,556 and the Federal Government provided \$2,267,624.

As shown in the above table this technical forestry assistance program is reaching annually about 91,418 woodland owners but this is only about 2 percent of the Nation's total.

In spite of increased State appropriations for this program and in spite of the increased accomplishments of private consulting and industrial foresters working with the small woodland owners, the combined existing forces are unable to keep up with present requests for assistance.

General Forestry Assistance

Work in rural development areas continued. In these areas where there is a surplus of timber and labor, new forest industries are being encouraged. Where woodland recreational possibilities exist, effort is made to create new employment in profitable recreational ventures. Of the 691 counties listed in the rural areas development program, 404 counties have at least one half of their land in forest.

The Forest Service continued to give specialized forest management assistance to the Defense Department and to other Federal and State agencies, and to the Congress, forest industries, consultants and forest schools, by a few specialists working out of Forest Service Regional Offices, and in close coordination with State Foresters.

Effective with fiscal year 1963, the Forest Service was directed to continue the forestry work in the Virgin Islands which was heretofore financed under the appropriation to the Virgin Islands Corporation. The \$30,000 appropriated for this purpose is being so used.



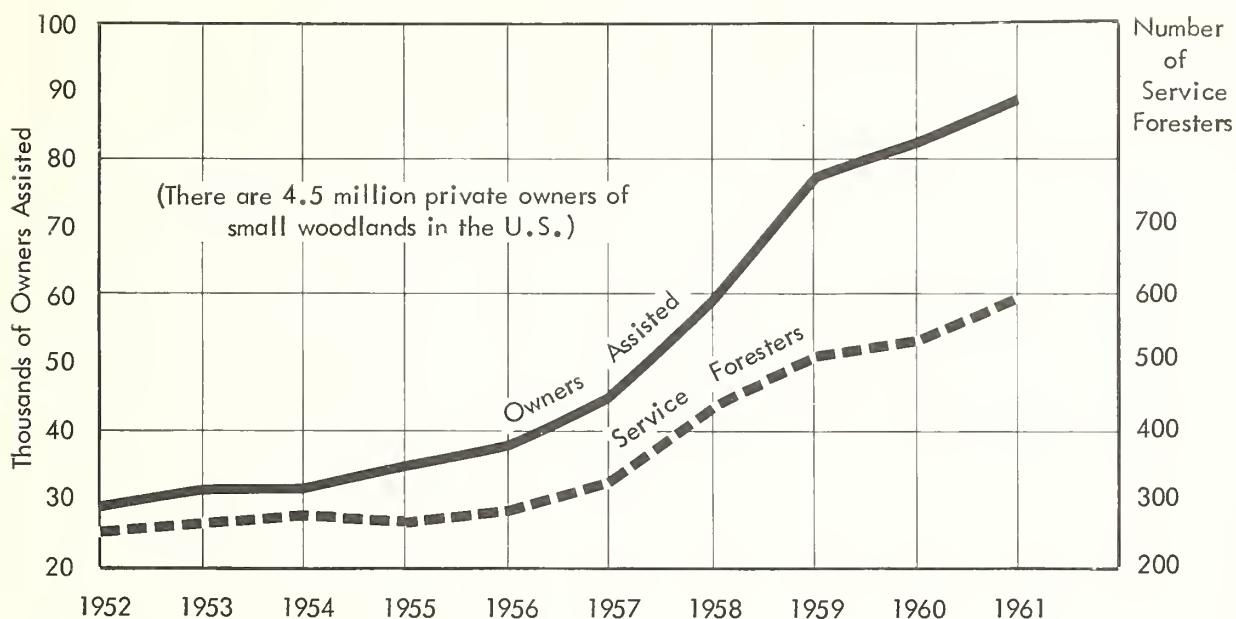
Cooperative Forest Management forester discussing woodland operation plans with owner.



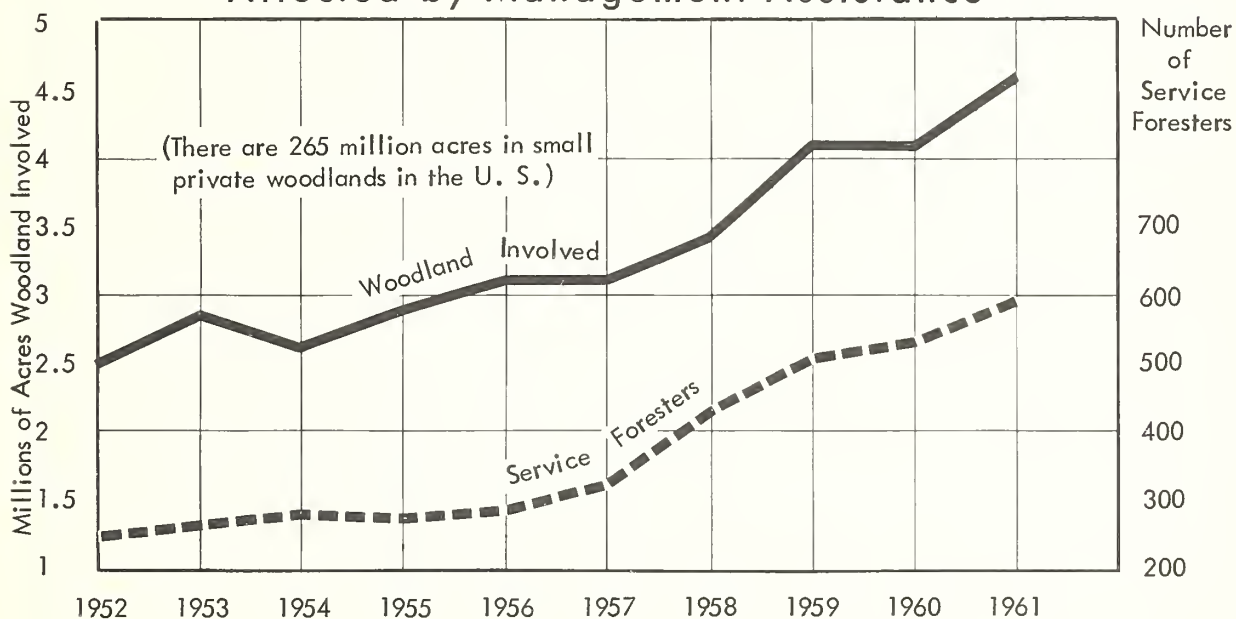
The Cooperative Forest Management Program resulted in this well managed private woodland.



## Relation of Number of Cooperative Forest Management Service Foresters to Woodland Owners Assisted in Better Management

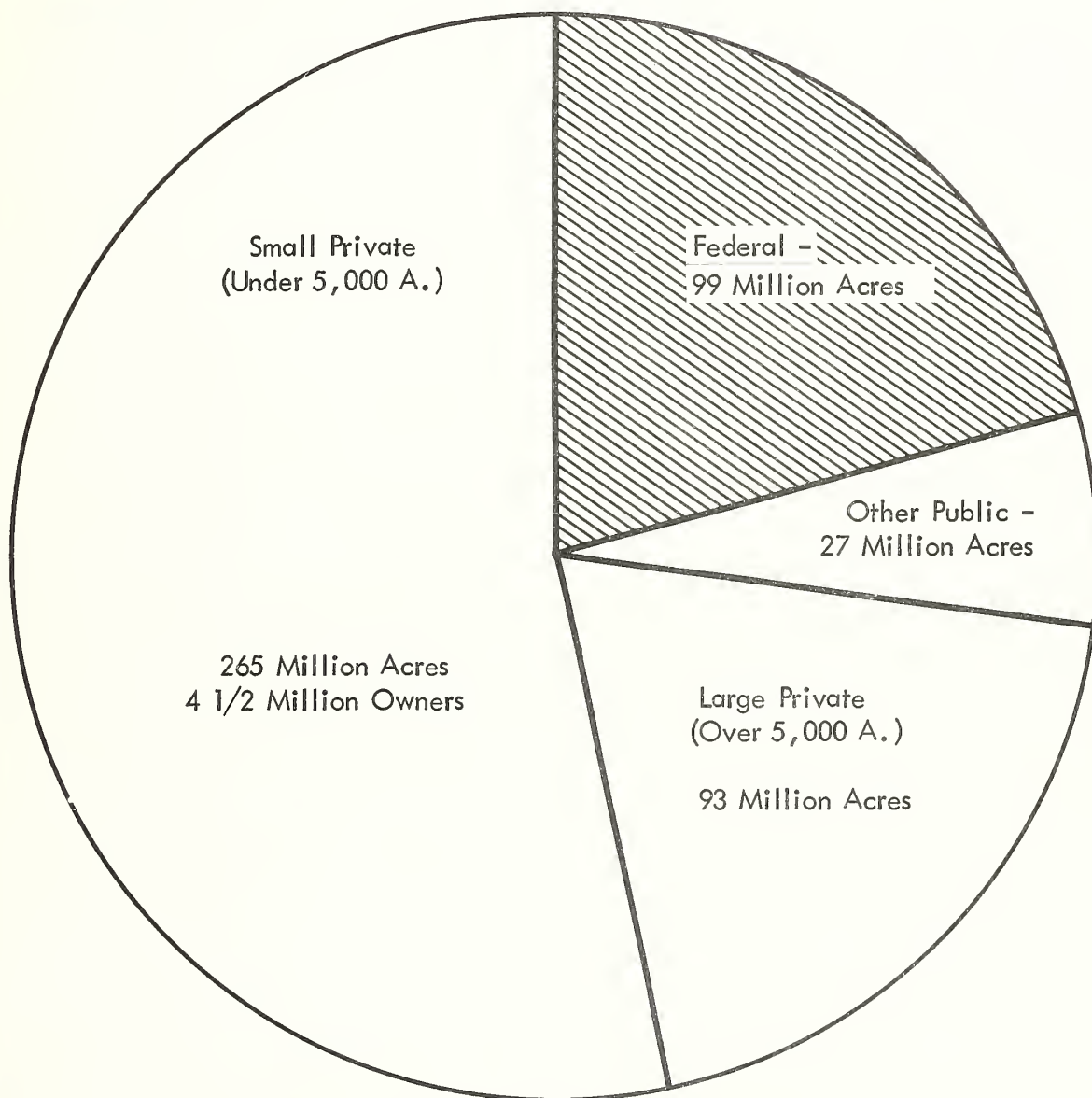


## Relation of Number of Cooperative Forest Management Service Foresters to Acres of Woodland Affected by Management Assistance





## Ownership Of Commercial Forest Lands In Continental U.S.



Unhatched area is the portion to which  
"State and Private" programs apply.



NOVAD'S

LANDS

PROV.

APPRO.

COMMON LANDS

DEVELOPMENT



(b) Forest Roads and Trails

Appropriation Act, 1963 .....	\$37,500,000
Anticipated Supplemental, 1963 .....	7,000,000
Base for 1964 .....	44,500,000
Budget Estimate, 1964 .....	66,400,000
Increase .....	<u>+21,900,000</u>

This appropriation provides for the liquidation of obligations incurred for the construction and maintenance of forest roads and trails pursuant to the authorization contained in the Federal Highway Acts of 1960 and 1962. Roads and trails are essential to protection and management of National Forests, and utilization of their resources. An appropriation of \$66,400,000 for 1964 will provide sufficient cash to liquidate prior year obligations, and obligations planned for fiscal year 1964 which must be paid by June 30, 1964.

Analysis of Cash Requirements by Activities a/

	<u>Actual 1962</u>	<u>Estimated 1963</u>	<u>Estimated 1964</u>	<u>Increase</u>
Construction of roads and trails .....	\$22,807,123	\$39,091,635	\$55,430,000	+\$16,338,365
Maintenance of roads and trails .....	9,470,823	9,447,165	10,970,000	+1,522,835
Total .....	<u>32,277,946</u>	<u>48,538,800</u>	<u>66,400,000</u>	<u>+17,861,200</u>

Authorizations for Appropriations a/

<u>Fiscal Year</u>	<u>Construction</u>	<u>Maintenance</u>	<u>Total</u>	<u>Funded</u>	<u>Unfunded</u>
1962	\$27,000,000	\$8,000,000	\$35,000,000	\$35,000,000	- -
1963	31,800,000	8,200,000	40,000,000	b/26,836,000	\$13,164,000
	c/10,000,000	- -	10,000,000	7,000,000	3,000,000
	<u>41,800,000</u>	<u>8,200,000</u>	<u>50,000,000</u>	<u>33,836,000</u>	<u>16,164,000</u>
1964	59,500,000	10,500,000	70,000,000	66,400,000	3,600,000
Total	<u>128,300,000</u>	<u>26,700,000</u>	<u>155,000,000</u>	<u>135,236,000</u>	<u>d/19,764,000</u>

a/ The annual appropriation language and the Department presentation combine the appropriation for "Forest roads and trails" made pursuant to 23 U.S.C. 205 and the appropriation of 10% of forest receipts for construction and maintenance of roads and trails pursuant to 16 U.S.C. 501. This merger of funds is made in order to simplify the programing, allotment, and accounting of funds at the field level. Since the accounts for these two funds are merged it is not practicable to distribute obligations and expenditures between the two appropriations on a precise basis. The amounts shown for the "Forest roads and trails" appropriation are a proration based on the percentage that contract authorization used under the appropriated funds is of total available funds. Expenditure amounts for maintenance are based on all such obligations requiring cash payment during the fiscal year.

b/ The 1963 appropriation of \$37,500,000 less prior year unfunded authorization of \$10,664,000 provides \$26,836,000 for funding of the \$40,000,000 authorization for 1963.

- c/ The Federal Highway Act of 1962 authorizes \$10,000,000 for 1963 under which a supplemental appropriation for 1963 of \$7,000,000 is proposed.
- d/ This budget estimate provides for utilization of \$65,000,000 of the available \$70,000,000 1964 Highway Act authority. Therefore, only \$14,764,000 of the unfunded authority will be obligated in fiscal year 1964 and \$5,000,000 authorization will lapse.

#### Status of Unfunded Authorizations

Unfunded contract authorizations beginning of 1963 .....	\$50,664,000
Appropriation, 1963 .....	-37,500,000
Anticipated supplemental appropriation, 1963 .....	-7,000,000
New contract authorization, 1963 (\$10,000,000, plus \$70,000,000 authorization for 1964 available in 1963 -- Federal Highway Act of 1962, approved October 23, 1962) ....	80,000,000
Total unfunded beginning of 1964 .....	86,164,000
1964 Budget Estimate (cash requirements) .....	-66,400,000
New contract authorization, 1964 (1965 authorization available in 1964 -- Federal Highway Act of 1962, approved October 23, 1962) .....	85,000,000
Unfunded .....	104,764,000
Less administrative cancellation of unfunded balance .....	-5,000,000
Balance to remain unfunded as of June 30, 1964 .....	<u>99,764,000</u>

#### Analysis of Cash Requirements

1. Unliquidated obligations June 30, 1962 .....	\$14,540,878
2. Estimated cash requirements to finance 1963 program (includes a proposed supplemental estimate of \$7 million) .....	a/33,997,922
3. Total cash requirements by June 30, 1963 .....	48,538,800
4. Less cash on hand 1963:	
Balance from 1962 .....	\$4,038,800
Appropriated 1963 .....	37,500,000
Proposed supplemental 1963 .....	7,000,000
5. Cash balance from 1963 available for use in 1964 .....	- -
6. Obligations in 1963 for which cash was not provided in item 2 .....	16,164,000
7. Estimated cash required to finance 1964 program .....	b/50,236,000
8. Total cash required for 1964 .....	<u>66,400,000</u>

- a/ An estimated 67.8 percent of the \$50,161,922 of new obligations will require cash payments during the fiscal year.
- b/ This is 77.3 percent of \$65,000,000 of new obligations. The increase in percentage over fiscal year 1963 is due to the following factors:
- (1) Pay Act costs (P.L. 87-793) amounting to \$1,800,000 are being absorbed within the available obligating authority. Since salary payments are made regularly through the year, additional cash payments are required to liquidate this additional obligation.
  - (2) Effective with fiscal year 1964, access road purchases formerly provided for in the separate Access Road appropriation are now included within the Federal Highway Act authorization. Normally such obligations must be fully funded as there is little elapsed time between the date of obligation and its liquidation. A total of \$3,800,000 is programed for purchase of roads in fiscal year 1964.

- (3) During past years many of the road construction contracts have been awarded during the months of May and June. Many State and County highway departments are also doing heavy road construction contracting during that season. Forest Service needs are therefore in direct competition with these agencies, and experience has shown that such competition frequently results in higher cost to the Government and, in some instances, has prevented making contract awards. The proposed 1964 program contemplates an increase in the number of contracts to be awarded during the late summer and fall. The early award of contracts will result in earlier construction starts with a corresponding increase in cash payments needed to liquidate current year's obligations under such contracts. National Forest administration will be facilitated by earlier availability of the road facility, and savings will be realized because it will be possible to award contracts during the period of the year when there is less competition with other road-building agencies.

The following tabulation reflects the total program for the construction and maintenance of roads and trails on the National Forests by combining the funds available under the appropriation "Forest roads and trails" with the permanent appropriation of 10% of national forest receipts. This permanent appropriation for Roads and trails for States (10% fund) is estimated at \$12,000,000 for 1964 compared with \$10,900,000 for 1963, an increase of \$1,100,000.

#### PROJECT STATEMENT

Project	1962	1963 (estimated)	Increase or Decrease		1964 (estimated)
			Increased	Other	
			Pay Costs (P.L. 87-793)		
1. Construction of:					
roads and trails	\$33,841,942	\$49,561,922	+\$1,298,000	+\$13,640,078	\$64,500,000
2. Maintenance of:					
roads and trails	12,113,138	11,500,000	+397,000	+603,000	12,500,000
Total obligations	45,955,080	61,061,922	+1,695,000	+14,243,078	77,000,000
Transfer from					
"Roads and trails					
for States" ....	-10,024,470	-10,900,000	- -	-1,100,000	-12,000,000
Program under					
"Forest roads					
and trails"					
contract					
authorization ..	35,930,610	50,161,922	+1,695,000	+13,143,078	65,000,000
Change in					
unfunded					
obligations ....	-930,610	-5,661,922	- -	+7,061,922	1,400,000
Subtotal .....	35,000,000	44,500,000	+1,695,000	+20,205,000	66,400,000
Total increased					
pay costs					
(P.L. 87-793) ..	(- -)	(862,000)	(+833,000)	(+105,000)	(1,800,000)
Total appropria-					
tion or estimate	35,000,000	44,500,000	+1,695,000(2)	+20,205,000	66,400,000

INCREASE

(1) An increase of \$20,205,000 in cash required for liquidation of contract authorization. This additional cash is required to:

- (a) Pay for obligations of the prior year which will be due for payment in fiscal year 1964, and
- (b) Pay the portion of 1964 obligations of \$65 million contract authorization which will require cash payment in that year.

The Federal Highway Act of 1962 provides an additional \$10 million authorization for fiscal year 1963 and an authorization of \$70 million for 1964. The net 1964 authorization increase is \$20 million.

In fiscal year 1963 an additional amount of \$2 million was separately provided in the Access Roads appropriation for purchase of full or partial interest in existing roads or rights-of-way. This separate appropriation has been eliminated effective with fiscal year 1963 and such purchases will be accomplished within the Federal Highway Act authorization. In view of this appropriation adjustment, the net increase in obligational authority for the road and trail program is \$18 million.

Forest development roads and trails provide access to National Forest lands for the protection, development, utilization, and multiple-use management of their resources. The existence of road and trail systems permits an intensity of management and the use for all National Forest purposes that is not otherwise possible. Furthermore, roads that give access to National Forest timber are investments which pay their own way over a period of years. Use of these roads by the public also results in substantial economic benefits to the localities the roads serve.

The long-range objective of the Forest Service is to provide and maintain a system of forest development roads and trails which will adequately service the National Forest System at the levels needed to meet expected needs and optimum production of products and services. For the year 2000 this means servicing (a) the protection requirements of a watershed producing at least 200 million acre-feet of water each year, (b) recreation and wildlife resources used each year by 635 million visitors, (c) a timber resource supporting an annual cut of 21 billion board feet, and (d) 60 million acres of rangelands.

Service at these levels of production and utilization will eventually require the construction of about 379,900 miles of new roads and 6,000 miles of new trails, along with the reconstruction to higher standards of about 105,000 miles of roads and 10,500 miles of trails. About 26,500 miles of existing trails will be replaced in service by the construction of new roads. About 80 percent of these long-range requirements should be met by the year 2000; about 17 percent (79,400 miles of roads and 8,000 miles of trails) should be completed by the end of fiscal year 1972.

Following is a summary of the program planned for fiscal year 1964:

Maintenance of roads and trails .....	\$12,500,000
Construction and reconstruction:	
Timber access roads (817 miles) .....	38,000,000
Recreation access roads (284 miles) .....	6,200,000
All-purpose access roads (582 miles) .....	14,900,000
All-purpose trails (568 miles) .....	1,600,000
Purchase of roads .....	<u>3,800,000</u>
Total .....	<u>77,000,000</u>

(2) An increase of \$1,695,000 pay costs pursuant to P.L. 87-793 consisting of \$1,207,000 to provide for full year costs of the first step of the pay increase pursuant to P.L. 87-793 and \$488,000 for fiscal year 1964 cost of the additional increase effective January 5, 1964.

Method of computing Pay Act costs.

1. Costs for 18-1/2 pay periods (October 14, 1962 through June 30, 1963) were computed on a local basis by individual regional and experiment station offices and for the Washington office using the following guidelines:
  - (a) Analysis of the actual cost of Pay Act salaries for all employees paid at classified rates on the basis of operating budgets which were prepared in accordance with the Appropriation Act for fiscal year 1963.
  - (b) Adjust costs developed in (a) above to a net figure by allowing for savings resulting from lapses (delays in filling vacant positions, leave without pay, lag in recruitment for new positions), from filling vacancies at lower rates of pay or from temporary employments for only part of the year; and to offset such savings by anticipated terminal leave payments.
  - (c) Addition of related increased personnel benefits costs such as the Government's contribution for retirement, employees' old age and survivors insurance, employee life insurance, and increased costs for payments to other agencies or revolving funds such as the Working Capital fund where increased salary costs will be reflected in the charge for services or materials so obtained.
2. Total Pay Act cost for 18-1/2 pay periods as developed above was then annualized to determine the equivalent cost for a full 26 pay periods.
3. By sample calculations of total service-wide grades and salaries, a weighted factor was developed for the January 1964 increase based upon averaging increases for each grade, taking into consideration the number of employees in each grade and the number of ungraded positions. This was then used to adjust the annualized Pay Act cost developed in (2) above to determine the full amount of such costs applicable to fiscal year 1964.

An analysis of increased pay requirements on the base for 1964 is shown in the following tabulation. (Pay costs related to increases requested for 1964 are included as a part of such increases.)

Full year cost of first step of pay increase .....	\$1,207,000
Additional amount required for second step of pay increase effective January 5, 1964 .....	<u>488,000</u>
Total pay costs, fiscal year 1964 for personnel on hand in 1963 .....	1,695,000
Deduct anticipated supplemental, fiscal year 1963, to cover 18.5 pay periods in 1963 .....	<u>a/ 0</u>
Additional amount required, fiscal year 1964 .....	<u><u>1,695,000</u></u>

a/ Pay costs of \$862,000 for fiscal year 1963 have been absorbed within the funding provided in the 1963 appropriation.

Available new obligation authority is not affected by the Pay Act (P.L. 87-793) as such authority was established by the Federal Highway Act of 1962 and by the administrative limitation which proposes that \$65 million of the \$70 million 1964 authority is to be utilized. Pay Act costs are to be absorbed within this proposed program level. Even though the obligational authority is not to be increased to cover such costs, cash requirements are increased by \$1,695,000.

### STATUS OF PROGRAM

An adequate system of access roads and trails is prerequisite to the protection, management, and development of the national forests and utilization of their resources. Under this program the existing system is maintained and additional roads and trails are constructed as needed to obtain the maximum practicable yield and use of the products and services of the forests on a continuing basis. As of June 30, 1962 the existing transportation system consisted of 182,085 miles of roads and 106,500 miles of foot and horse trails.

The system is maintained in part by the Government and in part by State and local road authorities, private cooperators, licensees, and permittees, and purchasers of Federal timber and other forest products. The following tabulation shows how the system was maintained in fiscal year 1962:

	<u>Roads</u>	<u>Trails</u>
	<u>(Approximate mileage)</u>	
By the Government .....	103,510	103,500
By others .....	<u>78,575</u>	<u>3,000</u>
Total .....	182,085	106,500

During fiscal year 1962, \$12,113,138 was obligated for maintenance and preservation of existing roads and trails and \$33,841,942 for road, trail, and bridge construction and reconstruction. In addition, purchasers of Federal timber accomplished road maintenance representing an estimated expenditure of \$4,658,153 and completed construction valued at \$48,896,625.

Construction completed in fiscal year 1962 was:

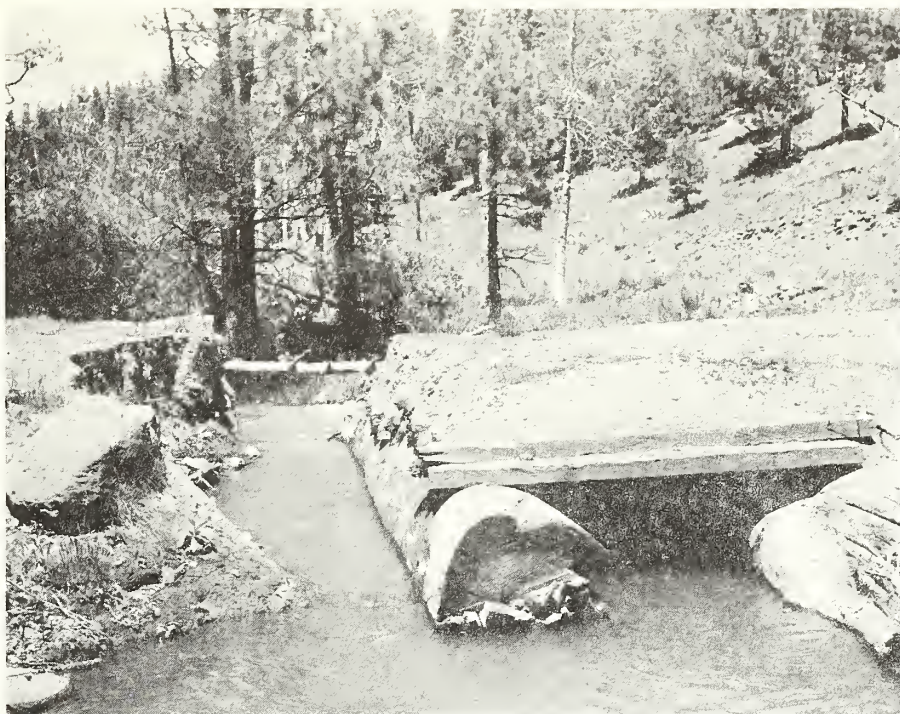
	<u>By the</u> <u>Government</u>	<u>By Purchasers of</u> <u>Federal Timber</u>
Roads .....	611.0 miles	3,692.7 miles
Trails .....	180.5 miles	- -
Bridges .....	247 each	26 each





Construction of properly located and drained roads permit economical use and management of the forests resources.





Replacement of temporary timber operator built structures is necessary for access and erosion control.



Proper location and construction of roads for access prevent erosion such as this caused by need for access by users where road does not exist.







(c) Access Roads

Appropriation, 1963 and base for 1964 .....	\$2,000,000
Budget Estimate, 1964 .....	- -
Decrease (due to elimination of this appropriation) .....	<u>-2,000,000</u>

PROJECT STATEMENT

Project	:	1962	:	1963	:	Increase or	:	1964
	:		:	:(estimated):	:	decrease	:	:(estimated)
Access roads a/.....	:	\$1,022,589:	:	\$3,128,629:	:	-\$3,128,629	:	- -
Unobligated balance brought:	:		:		:		:	
forward .....	:	-151,218:	:	-1,128,629:	:	1,128,629	:	- -
Unobligated balance carried:	:		:		:		:	
forward .....	:	1,128,629:	:	- -:	:	- -	:	- -
Appropriation or estimate	:	2,000,000:	:	2,000,000:	:	-2,000,000(1):	:	- -

a/ Represents obligations, applied costs for 1962 are \$933,459. The difference of \$89,130 represents an excess of orders placed over orders received in that year.

DECREASE

(1) This appropriation was initiated in fiscal year 1960 to permit the Forest Service to purchase, or to condemn if purchase negotiations failed, full or partial interest in existing roads or rights-of-way needed for access to National Forest areas so situated that other means of obtaining access was not practical or would not constitute an efficient expenditure of public funds. Where appropriate, the Forest Service charges a cost sharing user fee for use of roads so acquired so that benefiting landowners and timber purchasers will pay their proportionate share of the Government's acquisition cost for such roads. In view of the toll prohibition provision of 23 U.S.C. 301, it was determined that appropriations made under the authorizations of the Federal-Aid Highway Act could not be used for such road acquisition so the separate Access Roads appropriation was made.

In 1962, the question of user cost sharing charges relative to the toll prohibition of 23 U.S.C. 301 was submitted for review by the Comptroller General. In his decision of March 2, 1962 (B-65972) he stated that the charging of such fees was not considered to be a toll under the provisions of 23 U.S.C. 301 and that the Forest Roads and Trails appropriation could be used to purchase roads which would be subject to such user charges. In view of this decision, the separate appropriation is no longer necessary. Effective in fiscal year 1964 provision for such purchases will be included in the Federal-Aid Highway Act authorizations for forest development roads and trails and the related Forest Roads and Trails appropriation used to liquidate such obligations.

CHANGE IN LANGUAGE

The estimates propose deletion of language for this item as follows:

[Access Roads]

[For additional roads needed for access to national forest lands in carrying out the Act of June 4, 1897, as amended (16 U.S.C. 471, 472, 475, 476, 551), \$2,000,000.]

This language change deletes the appropriation in its entirety. Effective in fiscal year 1964 provision for access roads purchases are included in the Federal-Aid Highway Act authorizations for forest development roads and trails and the related Forest Roads and Trails appropriation will be used to liquidate such obligations.

STATUS OF PROGRAM

During fiscal year 1962, 715 cases were obtained involving 570 miles of raw-land easements or rights-of-way over existing roads or interests in existing roads. A total of 7 road rights-of-way condemnation cases were filed. An estimated 600 miles will be obtained in fiscal year 1963.





(d) Acquisition of Lands for National Forests, Special Acts

Appropriation Act, 1963 and base for 1964 .....	\$30,000
Budget Estimate, 1964 .....	70,000
Increase .....	<u>+40,000</u>

PROJECT STATEMENT

Project	1962	1963 (estimated)	Increase	1964 (estimated)
1. Cache National Forest, Utah a/	\$10,000	\$10,000	- -	\$10,000
2. Uinta and Wasatch National Forests, Utah .....	- -	20,000	- -	20,000
3. Toiyabe National Forest, Nevada .....	- -	- -	+\$8,000	8,000
4. Angeles National Forest, California .....	- -	- -	+8,000	8,000
5. Cleveland National Forest (San Diego County), California	- -	- -	+8,000	8,000
6. San Bernardino-Cleveland National Forests (Riverside County), California .....	- -	- -	+8,000	8,000
7. Sequoia National Forest, California .....	- -	- -	+8,000	8,000
Appropriation or estimate .....	10,000	30,000	+40,000(1)	70,000

a/ Represents obligations. Applied costs for 1962 are \$15,403. The difference of \$5,403 represents prior year obligations for purchase of land on which title was cleared in 1962.

INCREASE

(1) The Congress has enacted several special laws which authorize appropriation from the receipts of certain specified National Forests for the purchase of lands to minimize erosion and flood damage. Appropriations under seven of these special acts are recommended in fiscal year 1964:

<u>Forest and Act</u>	<u>Amount to be appropriated</u>
Cache (Utah), Act of May 11, 1938, as amended .....	\$10,000
Uinta-Wasatch (Utah), Act of August 26, 1935, as amended .....	20,000
Toiyabe (Nevada), Act of June 25, 1938, as amended .....	8,000
Angeles (California), Act of June 11, 1940 .....	8,000
Cleveland, San Diego County (California), Act of June 11, 1940.	8,000
San Bernardino-Cleveland, Riverside County (California), Act of June 15, 1938, as amended .....	8,000
Sequoia (California), Act of June 17, 1940 .....	8,000
Total .....	<u>70,000</u>

These Acts were passed with the support and concurrence of the local people and their local government bodies so that certain lands within these National Forests could be acquired and properly administered. These lands are not in the drainages of navigable streams; therefore, they cannot be acquired under provisions of the Weeks Law of March 1, 1911.

Appropriations were made annually through fiscal year 1953 for the purchase of lands under the provisions of these seven special acts. In fiscal year 1954 appropriations under these acts were discontinued but in fiscal year 1955 the \$10,000 appropriation for the Cache National Forest was reinstated. Appropriations under the Cache Act have been made in all but five of the years since its enactment.

In fiscal year 1963 the Congress reactivated the appropriation under provisions of the Uinta and Wasatch National Forests Receipts Act with a \$20,000 appropriation for initiation of a program to begin acquisition of critical watershed lands in the American Fork Canyon watershed. It is proposed to continue this acquisition program at the same level for fiscal year 1964.

There are within each of the above National Forest areas of critical watershed lands where the soil must be stabilized and vegetative cover restored if serious erosion and damaging floods are to be avoided. Necessary land treatment measures must be applied to all lands in the critical positions of these watersheds if corrective action is to be fully effective. To assure that this will be done, intermingled private ownership must be acquired by the Federal Government. Appropriations of the amounts requested will make it possible to start a systematic program of acquisition of these critical lands to permit immediate installation of the necessary corrective land treatment measures. This request represents the minimum financing required to permit a start in the acquisition of intermingled private lands.

#### CHANGES IN LANGUAGE

Changes in the language of this item are proposed as follows (new language underscored; deleted matter enclosed in brackets):

- [For the acquisition of land in the Cache National Forest, Utah, in accordance with the Act of May 11, 1938 (52 Stat. 347), as amended, \$10,000, to be derived from forest receipts as authorized by said Act: Provided, That no part of this appropriation shall be used for acquisition of any land which is not within the boundaries of a
- 1 national forest: Provided further, That no part of this appropriation shall be used for the acquisition of any land without the approval of the local government concerned.]

For acquisition of land to facilitate the control of soil erosion and flood damage originating within the exterior boundaries of the [Uinta and Wasatch National Forests] following national forests, in accordance with the provisions of the [Act of August 26, 1935 (49 Stat. 866), as amended] following Acts, authorizing annual [appropriation] appropriations of forest receipts for such purposes, and in not to exceed the  
2 following amounts from such receipts, [\$20,000] Cache National Forest, Utah, Act of May 11, 1938 (52 Stat. 347), as amended, \$10,000; Uinta and Wasatch National Forests, Utah, Act of August 26, 1935 (49 Stat. 866), as amended, \$20,000; Toiyabe National Forest, Nevada, Act of June 25, 1938 (52 Stat. 1205), as amended, \$8,000; Angeles National Forest, California, Act of June 11, 1940 (54 Stat. 299), \$8,000; Cleveland National Forest in San Diego, County, California, Act of June 11, 1940 (54 Stat. 297-298), \$8,000; San Bernardino and Cleveland National Forests in Riverside County, California, Act of June 15, 1938 (52 Stat. 699), \$8,000; Sequoia National Forest, California, Act of June 17, 1940 (54 Stat. 402), \$8,000; in all, \$70,000: Provided, That no part of this appropriation shall be used for acquisition of any land which is not within the boundaries of the national [forest] forests.

The first change eliminates the separate language for Cache National Forest, Utah. Included in this is the elimination of the proviso applicable to the Cache National Forest whereby no part of the appropriation shall be used for the acquisition of any land without the approval of the local government concerned. This proviso was not included in the 1963 appropriation for the Uinta and Wasatch National Forests Receipts Act appropriation. Since both of these areas are within the same State and the Receipts Act and the related appropriations were passed with the support of the local people and their local government bodies, there is no purpose in retaining such a proviso for the Cache National Forest appropriation. The same language would then apply to all appropriations made under these Special Acts.

The second change expands the appropriation to provide for reinstatement of land acquisition programs discontinued in fiscal year 1954. There are critical watershed lands within each of these National Forest areas where the soil must be stabilized and the vegetative cover restored if serious erosion and flood damage are to be avoided.

## STATUS OF PROGRAM

### Cache National Forest

In fiscal year 1962 funds were available from two sources for purchase of lands within the Cache National Forest in Utah.

1. The receipts act of May 11, 1938, as amended - \$10,000. This is an annual appropriation.
2. The act of July 24, 1956 - \$200,000 appropriated under this authority in fiscal years 1957 through 1960. These funds remain available until expended. Through fiscal year 1962 about \$95,000 has been obligated from this appropriation.

These funds are used to acquire key tracts of lands in the steep, rough and highly important watershed areas lying north of the Ogden River, along the Wasatch front, and on the Wellesville Mountain of the Cache National Forest. These are tracts of land in the rugged mountain area above the river valley which through forest fires or over-grazing have been damaged and their watershed functions impaired. In this condition, they contribute to excessive runoff of rainfall, are subject to erosion, and are potential sources of floods and mudrock flows. Many of them are located in the north fork of Ogden River and drain into the Pineview Reservoir, a Federal reclamation project. Others are within the watersheds of the City of Ogden and of the other small towns along the Wasatch front. Public ownership of these lands to restore and protect their vegetative cover is a highly important part of a vigorous cooperative program to protect and stabilize the watersheds of the local communities and the area draining into this expensive Federal project.

The 1956 Act requires that expenditures of Federal funds be matched by contributions by local agencies or people. This requirement has been met through donations of lands to the extent of some \$185,000. Additional contributions can be expected. The appropriation of \$10,000 under the Act of May 11, 1938 is from receipts of the Cache National Forest. In the absence of this appropriation, the local counties would receive 25% of these receipts for roads and school purposes. Therefore, the local counties in effect are contributing one-fourth of the amount of this appropriation. These appropriations are extremely important to the continuation of a vital and worthwhile program extending over twenty years and shared in by both the local agencies and the Federal Government through the National Forests.

Through fiscal year 1962, 27 304 acres have been approved for purchase pursuant to the Receipts Act of 1938, and 9,142 acres under the Special Act of 1956. The 1963 objective is to acquire from 2,000 to 3,000 additional acres of these critical watershed lands.

### Uinta-Wasatch

In fiscal year 1953 an appropriation of \$20,000 was made under the Uinta-Wasatch Receipts Act of August 26, 1935 to begin a program of acquiring critical watershed lands in the American Fork Canyon watershed. It is estimated that it will take from four to five years to complete the necessary American Fork acquisition.



Head of a canyon tributary to an important drainage on the Uinta National Forest in Utah. Note the depleted vegetative cover which shows erosion is already taking place. This area is ready to unravel when the first big storm occurs. This picture was made in September of 1957.



The storm came on August 19, 1959. Note the gully pattern that was created. Downstream damage was severe. Without corrective treatment each successive major storm will result in greater downstream damage.



Careful treatment has stabilized the site. Vegetative cover is restored. Careful future management will insure permanent stability.

This hazard exists on critical watersheds in each forest for which receipts act appropriations are proposed. Purchase of privately owned critical watershed lands and prompt rehabilitation work followed with careful management will effectively minimize the danger of erosion and flood damage.



(e) Acquisition of Lands for Wasatch National Forest

Appropriation, 1963 and base for 1964 .....	- -
Budget Estimate, 1964 .....	\$20,000
Increase .....	+20,000

PROJECT STATEMENT

Project	1962	1963 (estimated)	Increase	1964 (estimated)
Acquisition of lands for Wasatch National Forest (appropriation or estimate) .	- -	- -	+\$20,000(1)	\$20,000

INCREASE

(1) Public Law 87-661, approved September 14, 1962, added some 24,000 acres of land to the Wasatch National Forest in Utah of which only approximately 5,000 acres in scattered tracts are now in Federal ownership. This Act authorizes the appropriation of \$400,000 for the purchase of the privately owned lands in this area. Prompt Federal acquisition of these lands is imperative to aid in the control of floods and the reduction of soil erosion, and to permit management under principles of multiple use and sustained yield. The primary value of these lands is for watershed purposes. Presently most of the land is in a depleted condition from the standpoint of forage production and watershed capability. Sheet erosion is conspicuous on the steep upper slopes and drainages and the higher elevations are deeply gullied. On the bench lands the better forage and watershed plants have been largely replaced by annual plants of lesser value, and sheet erosion and gullying are beginning. These conditions, combined with the precipitous topography, pose threats of serious flood damage to properties below. Seven miles of the Gateway Canal are vulnerable to disrupting damage from excessive runoff or mudflows. This canal, a unit of the Weber Basin Reclamation Project, delivers vital supplies of water for distribution to heavily populated areas. Portions of the Union Pacific Railroad mainline and of Interstate Highway No. 40, as well as farmlands, also are vulnerable to damage originating on these lands. Public control of large contiguous areas comprising the watershed is essential in order that rehabilitation and land management measures may be undertaken to correct these unsatisfactory conditions.

The \$20,000 requested would be used to initiate the acquisition of some of the smaller key tracts in the area preparatory to negotiations for the purchase of the main private holding, a 14,000 acre tract in one ownership.

CHANGE IN LANGUAGE

The estimates include proposed new language for this item as follows:

For the acquisition of land in the Wasatch National Forest,  
Utah, in accordance with the Act of September 14, 1962  
(76 Stat. 545-546), \$20,000, to remain available until  
expended.

The proposed language would appropriate funds for the purchase of lands in the Wasatch National Forest in accordance with recently passed legislation as discussed above.

An initial appropriation is requested to initiate the acquisition of some of the smaller key tracts in the area preparatory to negotiations for the purchase of the main private holding, a 14,000 acre tract in one ownership.

(f) Acquisition of Lands for Superior National Forest

Appropriation Act, 1963 and base for 1964 .....	\$2,000,000
Budget Estimate, 1964 .....	- -
Decrease (due to full appropriation of the authorization) .....	<u><u>-2,000,000</u></u>

PROJECT STATEMENT

Project	1962	1963 (estimated)	Decrease	1964 (estimated)
Acquisition of lands for Superior National Forest <sup>a/</sup>	\$406,304	\$2,472,192	-\$2,472,192	- -
Unobligated balance brought forward .....	-628,496	-472,192	-472,192	- -
Unobligated balance carried forward .....	472,192	- -	- -	- -
Total increased pay costs (P.L. 87-793) .....	(- -)	(2,000)	(-2,000)	(- -)
Appropriation or estimate	250,000	2,000,000	-2,000,000(1)	- -

<sup>a/</sup> Represents obligations. Applied costs for 1962 are \$267,681. The difference of \$138,623 represents obligations for purchase of land on which title has not been finally cleared.

DECREASE

(1) The authorization of \$4.5 million contained in the Act of June 22, 1948 (62 Stat. 568), as amended by the Acts of June 22, 1956 (70 Stat. 326) and October 4, 1961 (75 Stat. 772), has been fully appropriated by the \$2 million appropriated for fiscal year 1963. Therefore, no funds are requested for fiscal year 1964.

CHANGE IN LANGUAGE

The estimates propose deletion of language for this item as follows:

[Superior National Forest]

[For completion of the acquisition of forest land within the Superior National Forest, Minnesota, under the provisions of the Act of June 22, 1948 (62 Stat. 570; 16 U.S.C. 577c-h), as amended, by purchase, condemnation or otherwise, \$2,000,000, to remain available until expended and to be available without regard to the restriction in the proviso in section 1 of that Act.]

This language change deletes the appropriation in its entirety since the authorization of \$4.5 million has been fully appropriated, and no estimate for this item is proposed in the 1964 budget.

# STATUS OF PROGRAM

The Act of June 22, 1948 (Public Law 80-733) as amended, provides authorization for the appropriation of \$4.5 million for the purchase of lands and improvements thereon in the Boundary Waters Canoe Area, Superior National Forest, Minnesota. The full amount of this authorization has been appropriated with the funds remaining available until expended.

The legislation authorized and directed the Secretary of Agriculture to acquire any properties which in his opinion should be in Federal ownership in order to restore and preserve the wilderness character of the remaining canoe country along the Canadian boundary in Minnesota. The available funds are sufficient to cover the cost of acquiring all of the remaining privately owned properties in the area. Actions to vest title in the United States are in various stages of completion for approximately 15,000 acres of privately owned lands including some 12 resort and 50 cabin installations. Present plans are to complete this acquisition program, except for the final steps in connection with title work, by June 30, 1963.

(g) Acquisition of Lands for Cache National Forest

PROJECT STATEMENT

Project	1962	1963 :(estimated):	1964 :(estimated)
Acquisition of lands for Cache National Forest <u>a/</u> .....	\$6,621	\$105,898	- -
Unobligated balance brought forward ....	-112,519	-105,898	- -
Unobligated balance carried forward ....	105,898	- -	- -
Appropriation or estimate .....	- -	- -	- -

a/ Represents obligations. Applied costs for 1962 are \$10,343. The difference of \$3,722 represents prior year obligations for purchase of land on which title was cleared in 1962.

STATUS OF PROGRAM

The 1956 Appropriation Act provided \$200,000 for the acquisition of lands in the Cache National Forest pursuant to the Act of July 24, 1956 (70 Stat. 632). Obligations under this fund are in addition to the \$10,000 appropriation from National Forest receipts authorized by the Act of May 11, 1938 and provided in the appropriation, "Acquisition of Lands for National Forests, Special Acts". Under the 1956 Act, funds appropriated must be matched by contribution of funds or land by local agencies or persons. A complete explanation of this program is included within the Status of Program for "Special Acts".

(h) Cooperative Range Improvements

Appropriation Act, 1963 and base for 1964 .....	\$700,000
Budget Estimate, 1964 .....	<u>700,000</u>

STATUS OF PROGRAM

Part of the grazing fees from the national forests, when appropriated, are used to protect or improve the productivity of the range, mainly by construction and maintenance of fences, stock-watering facilities, bridges, corrals, and driveways. These funds are advanced to and merged with the appropriation "Forest protection and utilization", subappropriation "Forest land management."

FORMULA FOR APPROPRIATION

Section 12 of the act of April 24, 1950 (Granger-Thye Act) provides that of the moneys received from grazing fees by the Treasury from each national forest during each fiscal year there shall be available at the end thereof when appropriated by Congress an amount equivalent to 2 cents per animal-month for sheep and goats and 10 cents per animal-month for other kinds of livestock under permit on such national forest during the calendar year in which the fiscal year begins.

The appropriation for this item since fiscal year 1951 has been \$700,000, except for fiscal years 1954 and 1955 when \$531,000 and \$400,000 were appropriated. Since the actual use figures are not available until after more than one-half of the fiscal year for which funds are appropriated has elapsed, the 1964 appropriation request of \$700,000 necessarily represents the best current approximation of the amount which will become available in the calendar year 1963 under the animal-months of use formula.

For calendar year 1961, the latest available figures, use amounted to 5,449,624 animal-months for cattle and horses; 6,631,249 animal-months for sheep and goats; and 3,484 for swine. This use under the 2 cents and 10 cents formula calculates to \$677,936.





(i) Assistance to States for Tree Planting

Appropriation Act, 1963 and base for 1964 .....	\$1,000,000
Budget Estimate, 1964 .....	<u>1,000,000</u>

PROJECT STATEMENT

Project	: 1962	: 1963	: Increase or:	1964
		:(estimated):	decrease	:(estimated)
Tree planting assistance a/	\$992,514:	\$1,007,486:	-\$7,486:	\$1,000,000
Unobligated balance brought forward .....	- - :	-7,486:	+7,486:	- -
Unobligated balance carried forward .....	7,486:	- - :	- - :	- -
Total increased pay costs (P.L. 87-793) .....	(- -) :	(5,000):	(+4,000):	(9,000)
Appropriation or estimate ..	1,000,000:	1,000,000:	- - :	1,000,000

a/ Represents obligations. Applied costs for 1962 are \$955,126. The difference of \$37,388 reflects, primarily, the excess of contracts and commitments made in fiscal year 1962 over contractual services received and payments earned by the States in that year.

# STATUS OF PROGRAM

Development of plans and actual work on the ground is progressing as authorized by Title IV of the Agricultural Act of 1956. Work was first undertaken in 1953 with an appropriation of \$500,000. Twenty-three plans in 19 States with a planned forestation of 864,000 acres were originally approved during fiscal year 1958. No funds were appropriated in 1959, 1960, or 1961. The program was reactivated by an appropriation of \$1 million for fiscal year 1962.

A total of 31 forestation plans presented by 25 State Foresters were approved as of December 31, 1961. These plans contemplate the forestation of 1,032,487 acres of land through planting, seeding, or site preparation and natural seeding at a total cost of \$30,213,188. The Federal share is estimated to be \$14,852,716 over a period of approximately 10 years.

Following is a summary by States of approved plans and fiscal year 1962 Federal payments:

<u>State</u>	<u>Acres</u>	<u>Total Cost</u>	<u>Total Federal Share</u>	<u>Payments in 1962</u>
Arkansas	1,100	\$ 16,698	\$ 8,349	-
Connecticut	23,400	444,600	222,300	1,500
Florida	80,370	2,419,981	1,209,990	80,851
Georgia	16,405	379,591	189,795	5,364
Idaho	2,200	103,250	51,625	10,027
Hawaii	9,000	1,151,000	575,500	20,000
Kentucky	4,800	260,158	130,079	8,000
Maine	11,350	328,755	131,502	15,500
Maryland	2,572	74,710	37,355	5,000
Massachusetts	20,000	638,000	223,000	5,000
Michigan	233,821	5,147,003	2,573,501	140,000
Minnesota	88,800	5,073,520	2,536,760	150,000
Mississippi	151,000	2,740,530	1,371,765	21,497
Montana	5,500	185,000	92,500	15,973
New Hampshire	7,515	255,345	127,672	3,500
New Jersey	60,000	54,000	27,000	5,400
Ohio	7,500	267,000	133,500	25,000
Oregon	166,067	4,354,760	2,177,380	125,000
Pennsylvania	5,559	627,497	313,748	35,000
Rhode Island	30,000	1,500,000	625,000	3,000
South Carolina	35,000	818,860	409,430	75,074
Tennessee	9,100	264,170	132,085	18,613
Vermont	1,928	86,760	43,380	1,000
Washington	100,000	2,595,000	1,297,500	125,000
Wisconsin	9,500	424,000	212,000	35,000
Total	1,082,487	30,213,188	14,852,716	930,299



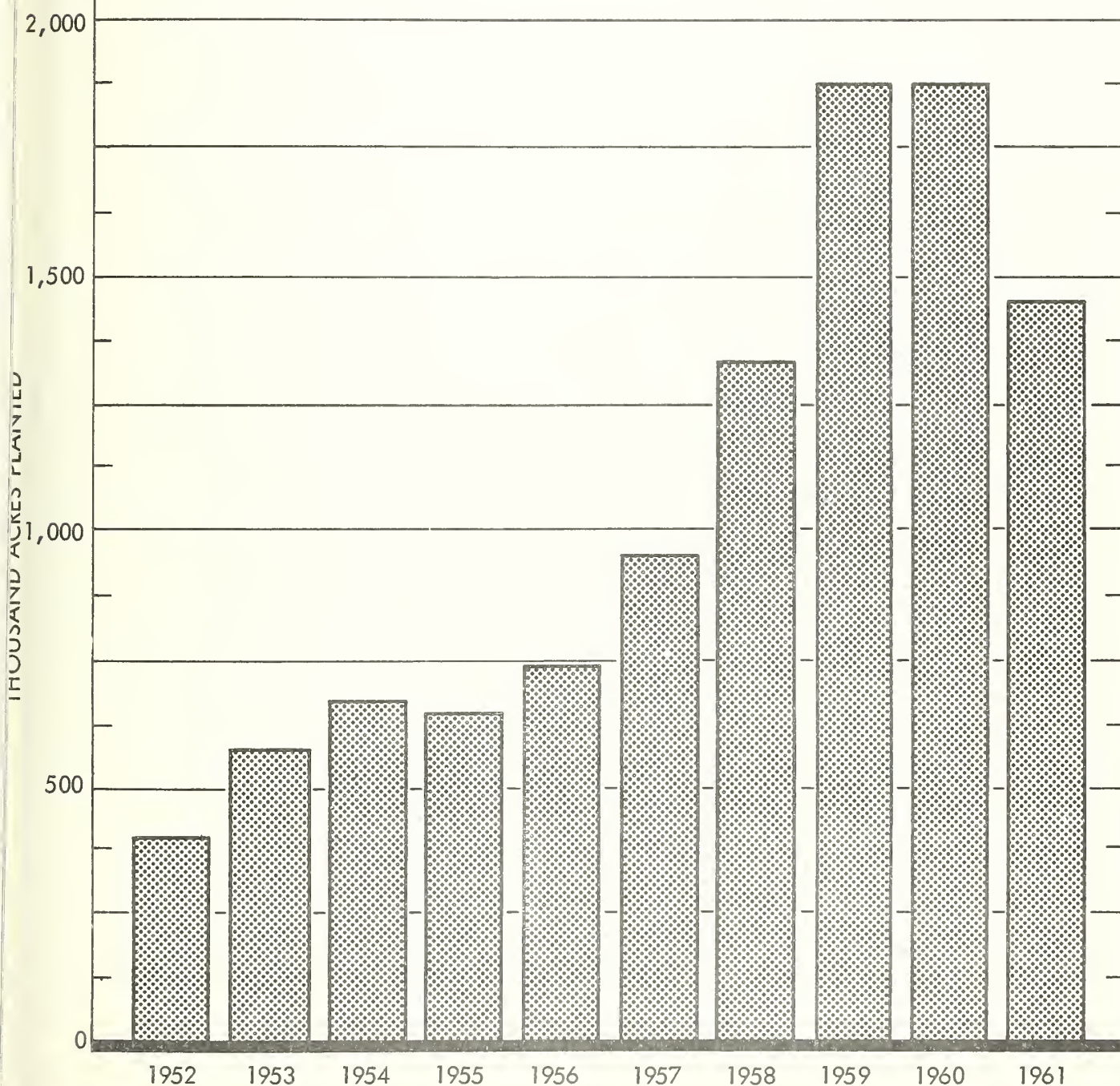
Eroded, non-productive lands such as this require immediate reforestation treatment to restore their resource productivity.



The same area six years after reforestation. Erosion loss is being arrested and the healthy timber stand that is developing will be available to meet the Nation's future timber needs. Both the land owner and the community will receive material economic benefits as these lands are restored to proper utilization productivity.



Acres of Forest Planting on Private Lands  
in the United States, 1952-1961  
(Including direct seeding)





PROV.

APPRO.

OTHER FUNDS

SAIRCRAFT



## ADMINISTRATIVE PROVISIONS

### CHANGES IN LANGUAGE

Changes in the language of this item are proposed as follows (new language underscored; deleted matter enclosed in brackets):

- Appropriations available to the Forest Service for the current fiscal year shall be available for: (a) purchase of not to exceed one hundred and [sixty-five] eighty-four passenger motor vehicles, of which one hundred and [thirty-seven] twenty-six shall be for replacement only, and hire of such vehicles; operation and maintenance of aircraft and the purchase of not to exceed [three] five of which [one] three shall be for replacement only; \* \* \* (f) acquisition of land and interests therein for sites for administrative purposes and acquisition of such outstanding interests in lands administered by the Forest Service as may be deemed necessary to their effective administration, pursuant to the Act of August 3, 1956 (7 U.S.C. 428a).

\* \* \*

Funds appropriated under this Act shall not be used for acquisition of forest lands under the provisions of the Act approved March 1, 1911, as amended (16 U.S.C. 513-519, 521), where such land is not within the boundaries of [a] an established national forest or purchase unit nor shall these lands [or lands authorized for purchase in Sanders County, Montana,] be acquired without approval of the local government concerned.

The first and second changes in language would provide authority for the Forest Service to purchase 184 passenger motor vehicles of which 126 will be replacements. A complete justification of this need appears in the justification of estimates for motor vehicles.

The third change in language would provide authority for the Forest Service to purchase five aircraft of which three will be replacements. It is also proposed to transfer four aircraft from other agencies as available. A justification of these needs appears with the estimates for aircraft.

The fourth change would provide authority for the Forest Service to acquire outstanding interests in lands administered by the Forest Service, including mineral rights, where such outstanding interests interfere with the use of the land and ownership of such outstanding interests is essential for administration.

Under existing authority (7 U.S.C. 428a), the Department of Agriculture is authorized to acquire land, or interests therein, by purchase, exchange, or otherwise as may be necessary to carry out its authorized work, provided that provision is made therefor in the applicable appropriation or other law. Section (f) of the Administrative Provisions, Forest Service, must be expanded so that appropriations of the Forest Service may be used, where necessary, to obtain outstanding interests in such land. The present language provides for the acquisition of sites to be used for administrative purposes such as a supervisor or ranger headquarters or for forest protection facilities. The proposed amendment would provide for the acquisition of outstanding interests, including mineral rights, in lands where such outstanding interests interfere with the use of the land and ownership of such outstanding interests is essential for administration.

At the present time the Forest Service has before it a land interest case which would be provided for under this language change. It is imperative that the Government's title to this land be clarified so that the interests of the Government can be protected and the land properly managed. In 1937, the United States acquired title to a tract consisting of 131.78 acres of land in the State of Georgia under the authority of the Resettlement Administration as a part of the Northeast Georgia Land Utilization Project. This land was transferred to the Forest Service for administration but due to its isolation from other National Forest lands, it was never given National Forest status. It therefore has been administered under Title III of the Bankhead-Jones Farm Tenant Act, 7 U.S.C. 1010, et seq.

In 1948 title to this land was challenged. Subsequently the individual claiming title cut and removed trees from the Government land. A temporary restraining order was issued by the United States District Court but the case was dismissed for the reason that the United States could not show record title or possessory title sufficient to meet the requirements of the Georgia law. Since that time all efforts to show perfect title have failed and the only way that the Government's interests can be protected is by the institution of a condemnation action and the filing therein of a declaration of taking, together with the deposit in the registry of the court of the sum of money estimated to be just compensation for the land taken.

The decision of the Comptroller General was obtained as to the legality of making such deposit from the appropriation "Forest Protection and Utilization, Forest Service." In his decision B-148669 of June 11, 1962 the Forest Service was advised that this appropriation is not available for the purchase of land of this nature and, accordingly, it may not be used for making the necessary deposit into the court in connection with the condemnation proceeding.

The fifth change. Prior to fiscal year 1954, funds appropriated for purchase of lands under the provisions of the Act of March 1, 1911 (Weeks Act) could be used by the Secretary of Agriculture to purchase forested, cut-over, or denuded lands within the watersheds of navigable streams as in his judgment were necessary to the regulation of the flow of navigable streams or for the production of timber subject to the approval of the National Forest Reservation Commission. In acting on the fiscal year 1954 Appropriation Bill, the House deleted the appropriation for such purchases. The appropriation act as approved restored the full amount but included a proviso that no part of the appropriation could be used for acquisition of any land which is not within the boundaries of a national forest. This restoration was granted on the justification that the money would be used to acquire key tracts intermingled within national forest units to reduce need for boundary surveys, avoid trespass problems, facilitate timber sales, prevent denudation of timber and other land misuse, and to otherwise facilitate proper management of the national forest lands.

This proviso failed to recognize that similar land ownership and management problems exist on approved national forest purchase units. As of June 30, 1962, there were 16 established purchase units for which Weeks Act funds

could not be used for land acquisition as the national forest boundaries have not yet been extended to include these areas. It would be possible to proceed to obtain proclamation of all purchase units as national forests; however, this is not presently practical, particularly in cases where the present Government ownership is small. Continuing study is being made of the ownership in these purchase units and proclamations will be recommended as the areas qualify. Expansion of the appropriation language to include purchases within established purchase units would facilitate consolidation of ownerships and would permit reasonable adjustments in national forest boundaries to serve the public need for management, protection, and development of the resources of these lands.

The sixth change. The Forest Service discontinued its winter range leases near Perma, Montana (in Sanders County) effective July 1, 1961 and there is no longer a need for possible purchase of lands in Sanders County. Therefore the authorization may be eliminated from this provision.

APPRO.

WINTER FUNDS

SALE/CRAFT



APPRO.

OTHER FUNDS

SALE/CRAFT



(j) Roads and Trails for States, National Forests Fund

Appropriation, 1963 and base for 1964 .....	\$10,900,000
Budget Estimate, 1964 .....	<u>12,000,000</u>
Increase (due to an estimated increase in national forest receipts in fiscal year 1963) .....	<u>+1,100,000</u>

The permanent appropriation of 10% of national forest receipts pursuant to the Act of March 4, 1913 (16 U.S.C. 501) is transferred to and merged with the annual appropriation for "Forest Roads and Trails." The explanation of the use of these funds is included in the justification for that appropriation item.

The increase of \$1,100,000 results from an estimated increase in receipts from sale of timber for fiscal year 1963.



(k) Expenses, Brush Disposal

Appropriation, 1963 and base for 1964 .....	\$9,000,000
Budget Estimate, 1964 .....	<u>9,000,000</u>

PROJECT STATEMENT

Project	1962	1963 (estimated)	Increase or decrease	1964 (estimated)
Brush disposal <u>a/</u> .....	\$6,175,314	\$8,000,000	+\$1,000,000	\$9,000,000
Unobligated balance brought: forward .....	-2,207,250	-6,569,022	-1,000,000	-7,569,022
Recovery of prior year advance for fighting forest fires .....	-2,838,024	- -	- -	- -
Unobligated balance carried: forward .....	6,569,022	7,569,022	- -	7,569,022
Total increased pay costs (P.L. 87-793) .....	(- -)	(132,000)	(+150,000)	(282,000)
Appropriation or estimate	7,699,061	9,000,000	- -	9,000,000

a/ Represents obligations. Applied costs for 1962 are \$6,113,128. The difference of \$62,186 reflects, primarily, contractual services and equipment received in 1962 over contracts made and orders placed in that year.

## STATUS OF PROGRAM

Timber cutting usually increases the fire hazard as a result of the increase of dry fuel in the form of logging slash. Frequently this logging slash also is the principal factor contributing to the buildup of insect populations in cutover areas and it may increase certain disease infestations. Damage may result from postsale movement of logging slash and debris into stream channels. Where treatment is to reduce the threat of insect or disease buildup, methods are coordinated with other treatments of the sale area--principally treatments to reduce fire hazard.

Because of these factors, national-forest timber sale contracts require treatment of debris resulting from cutting operations or deposit of funds to pay for this work, to the degree necessary to reduce fire hazard and buildup of insect populations to a point near normal, and to remove logging debris which might move into streams after the sale is closed. To the extent that it is economical and expedient to do so, the work is performed by the timber purchaser. When it is not feasible to have him do the work, it must be performed by the Government. The Brush Disposal appropriation represents deposits by the timber purchaser to cover costs of the work when it is to be performed by the Government as authorized under Section 6 of the Act of April 24, 1950 (16 U.S.C. 490).

There is a wide variation among Regions in the effect of timber cutting, and consequently in the manner of treating slash and debris. In the three eastern Regions, the volume cut per acre is relatively low, utilization is high, and the general humid atmospheric conditions result in rapid decomposition of debris so little slash disposal work is necessary on sale areas in these three Regions. The exception is in some sales in the pine type, such as the jack pine stands of Minnesota, where a heavier cut per acre is made. In such areas slash can be broken up by disking with heavy equipment which mixes it with the mineral soil so that the hazard is reduced and a good seedbed is provided to aid regeneration. Treatment of slash to prevent insect epidemics is sometimes necessary in these areas.

In contrast to the light slash disposal requirements in the eastern Regions the cost of slash abatement on most sale areas of the West is high. The treatment varies greatly due to different methods of cutting. For instance, clear-cut areas in the Douglas-fir region are broadcast burned. In selectively cut areas the debris may be piled for burning. This may be done over the whole area or only in strips which break the area up into blocks.

While slash disposal follows general prescriptions within Regions, the individual needs of each sale offering are planned and appraised prior to advertisement and appropriate specific requirements are incorporated into each timber sale contract. In each instance the least expensive method or combination of methods is used which will attain adequate protection of the area. In some instances adequate protection from fire is attained at less cost by providing additional protection for sale areas until the slash hazard reverts to near normal. Logging debris which moves into water courses under these conditions must be removed. Greater intensity of fire protection for several years and occasional stream clearance may be less costly than complete slash disposal immediately after cutting. In such cases Brush Disposal funds are used in providing the needed manpower and facilities.



Typical clear cut area. Brush disposal funds deposited by the timber sale purchaser are used to broadcast burn the logging slash and debris in preparation for reforestation treatment.



Sale area betterment (KV) deposits made by the timber sale purchaser are used for reforestation of areas that fail to reseed naturally.



(1) Forest Fire Prevention

Appropriation, 1963 and base for 1964 .....	\$20,000
Budget Estimate, 1964 .....	<u>20,000</u>

PROJECT STATEMENT

Project	1962	1963 :(estimated):	1964 :(estimated)
Forest fire prevention a/ .....	\$24,964	\$21,800	\$20,000
Unobligated balance brought forward . .	-7,160	-1,800	- -
Unobligated balance carried forward . .	1,800	- -	- -
Appropriation or estimate .....	<u>19,604</u>	<u>20,000</u>	<u>20,000</u>

a/ Represents obligations. Applied costs for 1962 are \$25,046. The difference of \$82 reflects, primarily, printing and reproduction, supplies and materials received in 1962 over orders placed in that year.

STATUS OF PROGRAM

The Smokey Bear licensing program is an important part of the Cooperative Forest Fire Prevention Campaign which has been in effect for 21 years. The Campaign itself has been conducted each year since 1942 as a cooperative project of the State Foresters and the Forest Service, United States Department of Agriculture, and is a public service program of the Advertising Council. The purpose of this Campaign is to utilize the free public service resources of the various national advertising channels such as car cards, poster display systems, radio and television networks and magazine and newspaper allocation plans in developing public cooperation in the prevention of man-caused forest fires. Since 1945, this Campaign has been built around Smokey Bear who has become recognized and accepted by the public as a nationwide symbol of forest fire prevention.

Under authorization of Public Law 359 of the 82nd Congress, the Secretary of Agriculture has issued rules and regulations governing the licensing program. These licenses specify payment of royalties (usually 5%) and set up certain controls for administering the program and collecting the royalties including advance deposits to protect the Government's interest. Such collections, along with appropriated funds, are used to finance the Cooperative Forest Fire Prevention Campaign.

Commercial support for the Smokey Bear Program continues moderately strong. Inactive licenses are being closed out and new licenses processed at the rate of about two a month. Receipts for fiscal year 1962 were only \$400 short of the \$20,000 estimated. It is expected that both 1963 and 1964 receipts will equal or exceed \$20,000. Application of more effort to this phase of the program could result in the doubling of receipts after the first year. However, massive promotion must be avoided or the result would be a surge in sales of Smokey Bear items followed by a severe slump. A solid continuing program in the \$1 million to \$2 million retail sales range will do more lasting good.

#### Selected Examples of Recent Progress

1. Area burned by forest fires in 1961 was less than 5,000 square miles for the first time. The number of man-caused forest fires was down by more than 8,500 from 1960. At the same time, visits to forest areas were at an all time high, which makes the record more significant.
2. Through the cooperation of the Newspaper Advertising Executives Association, more than 5,400 special forest fire prevention advertisements were placed in 499 daily newspapers from Coast to Coast during the critical months of April, May, and June 1962. A series of thirteen 100-line weekly advertisements were prepared for this purpose.
3. For the first time in the history of the CFFP Campaign, Forest Fire Prevention radio kits were mailed to all commercial radio stations. This represents an increase in distribution from 1,200 to 3,300 stations.
4. The Secretary of Agriculture revised the regulations relating to Smokey Bear effective July 17, 1962, the tenth anniversary of the original regulations. The new regulations permit the Bureau of Customs to stop the importation of unauthorized commercial Smokey Bear items at the port of entry. Also, public service use is better defined.
5. A Smokey Bear awards policy has been approved. The new policy establishes awards for outstanding service in forest fire prevention of national, regional or State, local, and "in-service" scope and effect.

(m) Restoration of Forest Lands and Improvements

Appropriation, 1963 and base for 1964 .....	\$196,000
Budget Estimate, 1964 .....	100,000
Decrease .....	<u>-96,000</u>

PROJECT STATEMENT

Project	1962	1963 (estimated)	Increase or decrease	1964 (estimated)
Restoration of forest lands: and improvements a/ ....	\$6,415	\$203,400	-\$103,400	\$100,000
Unobligated balance brought forward .....	-4,270	-7,400	7,400	- -
Unobligated balance carried: forward .....	7,400	- -	- -	- -
Total increased pay costs (P.L. 87-793) .....	(- -)	(2,000)	(- -)	(2,000)
Appropriation or estimate	9,545	196,000	-96,000(1)	100,000

a/ Reflects obligations. Applied costs for 1962 are \$6,250. The difference of \$165 reflects orders for supplies and materials placed in 1962, not received in that year.

DECREASE

(1) A decrease of \$96,000 is estimated at this time. This item is extremely difficult to forecast as it depends upon the extent and frequency of such damage sustained. The indicated reduction is based upon past history and more realistically represents the impact of this item.

STATUS OF PROGRAM

Recoveries from cash bonds or forfeitures under surety bonds by permittees or timber purchasers, who fail to complete performance, are used to complete improvement, protection, or rehabilitation work on lands under Forest Service administration. Funds received as settlement of a claim are used for improvement, protection, or rehabilitation made necessary by the action which led to the cash settlement (Act of June 20, 1958, 16 U.S.C. 579c).

WORK  
OTHER FUNDS

SALICRAFT

(n) Payment to Minnesota (Cook, Lake, and St. Louis Counties)  
from the National Forests Fund

Appropriation, 1963 and base for 1964 .....	\$125,432
Budget Estimate, 1964 .....	128,000
Increase .....	<u>+2,568</u>

PROJECT STATEMENT

Project	: 1962	: 1963	: Increase	: 1964
	:	:(estimated):	:	:(estimated):
Payment to Minnesota	:	:	:	:
(appropriation or	:	:	:	:
estimate) .....	: \$123,550	: \$125,432	: +\$2,568(1)	: \$128,000

INCREASE

(1) The estimated increase results from the change in total fair appraised value resulting from the purchase of additional lands within these counties.

STATUS OF PROGRAM

The Act of June 22, 1948, as amended (16 U.S.C. 577c-577h) provides that the Secretary of the Treasury, upon certification of the Secretary of Agriculture, shall pay to the State of Minnesota at the close of each fiscal year an amount equivalent to three-fourths of one percent of the fair appraised value of certain national forest lands in the counties of Cook, Lake, and St. Louis situated within the Superior National Forest. The Act further provides that payment to the State shall be distributed to each of these counties in conformity with the fair appraised value of such national forest lands in each county.

(o) Payments to Counties, National Grasslands

Appropriation, 1963 and base for 1964 .....	\$425,000
Budget Estimate, 1964 .....	<u>437,500</u>
Increase (due to an estimated increase in national grasslands receipts for the fiscal year 1963) .....	<u>+12,500</u>

PROJECT STATEMENT

Project	:	1962	:	1963 :(estimated):	:	Increase	:	1964 :(estimated)
Payments to counties, national grasslands (appropriation or estimate) .....	:		:		:		:	
	:		:		:		:	
	:		:		:		:	
	:		:		:		:	
	:	\$420,714	:	\$425,000	:	+\$12,500	:	\$437,500

STATUS OF PROGRAM

At the end of each calendar year, 25% of the revenues from the use of sub-marginal lands are paid to counties under the provisions of Title III of the Bankhead-Jones Farm Tenant Act, approved July 22, 1937 (7 U.S.C. 1012).

OTHER FUNDS

SAITCRRAFT

(p) Payments to School Funds, Arizona and New Mexico,  
Act of June 20, 1910

Appropriation, 1963 and base for 1964 .....	\$80,500
Budget Estimate, 1964 .....	100,000
Increase (due to an estimated increase in national forest receipts for the fiscal year 1963) .....	<u>+19,500</u>

PROJECT STATEMENT

Project	1962	1963 (estimated)	Increase	1964 (estimated)
Payments to school funds (appropriation or estimate) .....	\$99,211	\$80,500	+\$19,500	\$100,000

STATUS OF PROGRAM

Under provisions of the Act of June 20, 1910 (36 Stat. 562, 573) certain areas within national forests were granted to the States for school purposes. The percentage that these lands are of the total national forest area within the State is used in determining payments to the States. The receipts from all national forest land within the State are used as the basis for applying the percentage. For example, if total receipts for the State are \$100,000 and if 10% of lands are in the "granted for school purposes" category, the payment to the State would be \$10,000. The amounts so paid are deducted from the net receipts before computing the 25% payments to States.

As soon after the close of the fiscal year as the receipts from national forests and the area of school lands in the States of Arizona and New Mexico are determined, the payments are made to the States. Estimated payments in fiscal year 1963 to Arizona will be \$80,142 and to New Mexico \$320.

(q) Payments to States, National Forests Fund

Appropriation, 1963 and base for 1964 .....	\$27,235,140
Budget Estimate, 1964 .....	<u>30,000,000</u>
Increase (due to an estimated increase in the national forest receipts for the fiscal year 1963) .....	<u>+2,764,860</u>

PROJECT STATEMENT

Project	1962	1963 :(estimated)	Increase	1964 :(estimated)
Payments to States (appropriation or estimate) .....	\$25,056,348	\$27,235,140	+\$2,764,860	\$30,000,000

STATUS OF PROGRAM

The Act of May 23, 1908, as amended (16 U.S.C. 500) requires, with a few exceptions, that 25% of all money received from the national forests during any fiscal year be paid to the States in which the forests are located, for the benefit of public schools and public roads of the county or counties in which such national forests are situated. The amount of this appropriation varies each year in direct proportion to national forest receipts during the previous fiscal year.

The amounts set aside from receipts collected for the sale of national forest timber, grazing and special use permits, etc., before the 25% is applied are listed below:

1. Payment to the State of Minnesota covering certain national forest lands in the Counties of Cook, Lake, and St. Louis situated within the Superior National Forest is made under the terms of the Act of June 22, 1948, Public Law 733. Receipts collected from the areas covered by this Act are excluded when the 25% payment to the State of Minnesota is computed.
2. For lands in certain counties in Utah, Nevada, and California, the States receive 25% of receipts only after funds, if made available by Congress, have been set aside for the acquisition of national forest lands within the specified national forests under the terms of special acts authorizing appropriations from forest receipts for this purpose.
3. Payments to the States of Arizona and New Mexico under the provisions of the Act of June 20, 1910, of shares of the gross receipts from the national forests in those States which are proportionate to the areas of land granted to the States for school purposes within the national forests.

(r) Working Capital Fund, Forest Service

This fund finances on a reimbursable basis various services such as repairing and replacing equipment, including aircraft, stocking and issuing supplies, operation of subsistence camps, operation of photographic and reproduction facilities, and tree nurseries in support of programs of the Forest Service (16 U.S.C. 579b, as amended). These service operations serve programs of fire protection, timber utilization, construction and maintenance of roads and other improvements, reforestation, grazing, watershed, forest and forest products research, and kindred conservation activities of the Forest Service, including cooperative assistance with other Federal agencies, States, counties, and individuals engaged in the same objectives.

Operating results and financial condition.--Government investment in the fund as of June 30, 1962, including donated assets and retained earnings for fiscal year 1962, is \$25,751,096. By the end of 1964 the investment is anticipated to be \$30,851,000, an increase of \$5,099,904 which represents estimated earnings and donations during 1963 and 1964.

Receipts, non-operating income, and retained earnings include an estimated \$2,000,000 as of June 30, 1964, identified as "Income provision for increased cost of equipment replacements" to be used only for financing the increased cost of equipment replacement, i.e., the difference between the cost of the replacement unit and the cost at time of acquisition of the unit being replaced. This increased cost is due to inflation and model improvement, and must be financed if the fleet strength is to be maintained and not depleted through the gradual attrition of price increases for replacements. The earnings for the provision for increased cost of replacements are derived from a factor which is included for this purpose in rental rates charged to program appropriations for equipment use and credited to the Working Capital Fund.

Retained earnings as of June 30, 1964, will total an estimated \$6,151,000 which will consist of \$2,051,000 gain on sale of equipment, \$2,100,000 profit from operations, and \$2,000,000 for provision for increased cost of replacement of equipment. Retained earnings have been applied toward increased cost of equipment replacements, purchase of fleet additions, and to furnish adequate working capital.

WORK

OTHER FUNDS

SALICRAFT



Cooperative Work, Forest Service (Trust Fund)

Contributions are received from cooperators, including counties, States, timber sale operators, individuals, and associations, and are expended by the Forest Service in accordance with the terms of the applicable cooperative agreements. The work consists of protection and improvement of the national forests, work performed for national forest users, and forest investigations and protection, reforestation, and administration of private forest lands.

The major programs conducted under the account "Cooperative Work, Forest Service" are described below in terms of the projects reflected in the statement at the end of this section.

1. Construction and Maintenance of Roads and Trails, and
2. Construction and Maintenance of Other Improvements:

Under the Acts of June 30, 1914 (16 U.S.C. 498) and March 3, 1925 and April 24, 1950 (16 U.S.C. 572) deposits for cooperative work are accepted from State and local government agencies, associations, Federal timber purchasers, and others for the construction and maintenance of roads, trails, and other improvements and for performing work which is the national forest users' responsibility, this method of performance of the work being of mutual benefit or of benefit to the public at large.

3. Protection of National Forests and Adjacent Private Lands: The Act of June 30, 1914 (16 U.S.C. 498) authorizes the acceptance of deposits for the protection of the national forests and the Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 U.S.C. 572), authorizes the acceptance of contributions for the protection of private lands in or near the national forests. The major portion of the obligations is for the protection of private lands from fire. This arrangement helps both parties since there are millions of acres of private forest land intermingled with Federal ownership on the national forests. The lands in private ownership are usually in small tracts. It would be uneconomical for the owner to set up a fire control organization for the protection of his land. The advantage to the Government is that in many cases it would be necessary to suppress the fires on the private land without reimbursement in order to protect the adjoining Federal land.
4. Sale Area Betterment (including reforestation): Section 3 of the Act of June 9, 1930 (16 U.S.C. 576b) provides for deposits of funds by timber sale purchasers to cover the cost of reforestation and special cultural measures to improve the future stand of timber on the areas cutover by the purchaser. Deposits in fiscal year 1962 under this authorization totaled \$16.3 million. Fiscal year 1962 accomplishments under this program are reported under the Forest Land Management subappropriation along with accomplishments for reforestation and stand improvement for that subappropriation.

OTHER FUNDS

SAIRGRAFT

- 100 -
5. Scaling: Under provisions of the Act of April 24, 1950 (16 U.S.C. 572) and of Section 210 of the Act of September 21, 1944 (16 U.S.C. 572a) acceptance of deposits from timber purchasers for cooperative scaling service is authorized. Such arrangements are established only when requested by the operator and when the operator pays the extra cost of such services.
  6. Research Investigations: The Acts of June 30, 1914 (16 U.S.C. 498) and May 22, 1928 (16 U.S.C. 581i-1) authorize the acceptance of deposits for forestry research. Deposits are received from State and other public agencies, and from industrial, association, and other private agencies to finance research projects of mutual interest and benefit to both parties. The deposits may be made either in a single sum or on a continuing basis, and may either partially or wholly cover the cost of the research. The cooperative research projects may involve any aspect of forestry and vary widely as to scope and duration. A very common example of such cooperation is for a State to make a deposit to the cooperative work fund in order to intensify or to speed up completion of a comprehensive survey of the forest resources of the State. Other examples are State contributions toward forest fire research. The results of such cooperative investigations are made available to the general public as well as to the depositor.
  7. Administration of Private Lands: The Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 U.S.C. 572) authorizes the acceptance of contributions for the management of private lands. These contributions are made by private owners having land intermingled with or adjacent to national forests who wish these lands managed in accordance with good forest management practices. Their holdings are usually too small to warrant the employment of professional foresters to administer such tracts. The advantages to the Government include the avoidance of possible high fire hazard areas resulting from improper cutting practices, the elimination of the necessity of precisely marking the boundaries of the private land, and additional private forest land handled under proper forest practices.
  8. Reforestation (private lands): The Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 U.S.C. 572) authorizes the acceptance of contributions for reforestation of private lands situated within or near a national forest. This work is limited to areas of private land within a planting project on the national forests or to areas in which certain civic and other public-spirited organizations have taken an interest.
  9. Statement on Utilization of Funds: Following is a statement of funds received and obligated and balances available by major activities:

## COOPERATIVE WORK, FOREST SERVICE

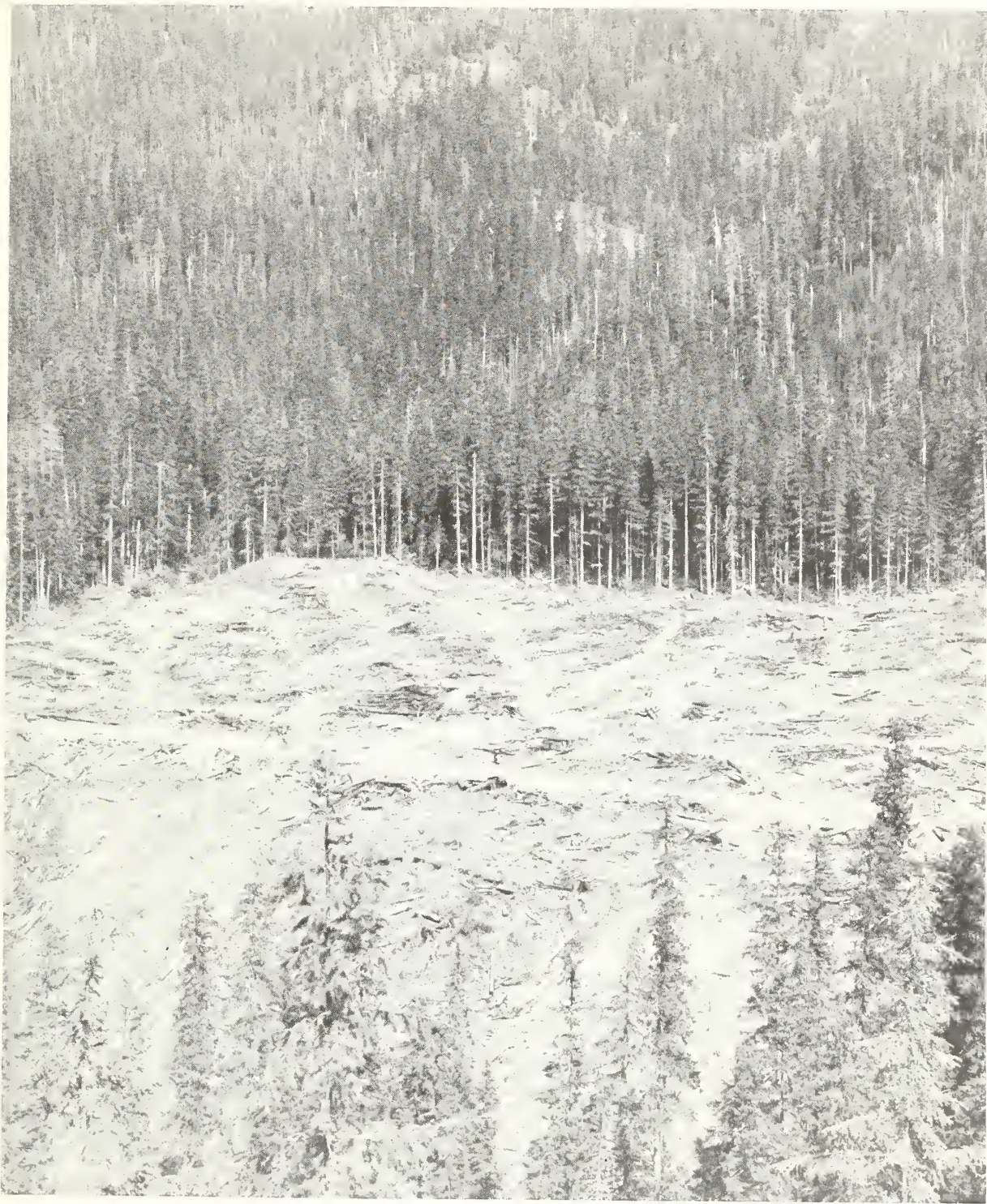
## Trust Fund

Project	Balance available June 30, 1961	Actual fiscal year 1962		Estimate fiscal year 1963		Estimate fiscal year 1964	
		Funds received	Obligations: Balance	Funds received	Obligations: Balance	Funds received	Obligations: Balance
1. Construction and maintenance of roads and trails .....	\$1,029,895	\$1,201,933	\$1,446,258	\$1,300,000	\$785,570	\$1,300,000	\$1,300,000
2. Construction and maintenance of other improvements .....	251,490	571,532	408,930	450,000	414,092	450,000	450,000
3. Protection on national forests and adjacent private land:							
(a) Fire .....	343,322	1,747,942	1,682,883	1,750,000	408,381	1,800,000	1,800,000
(b) Other .....	961,040	1,158,199	1,133,759	1,150,000	985,480	1,150,000	1,150,000
4. Sale area betterment on national forest lands (including reforestation) ...	16,367,694	16,252,394	12,521,123	17,300,000	20,098,965	18,500,000	16,550,000
5. Scaling of timber .....	224,888	605,397	596,747	600,000	233,538	600,000	600,000
6. Research investigations .....	311,464	1,018,633	967,167	1,000,000	362,930	1,000,000	1,000,000
7. Administration of private lands .....	17,503	59,710	63,420	70,000	13,793	70,000	70,000
8. Reforestation (private lands)	105,784	72,926	72,936	75,000	105,774	75,000	80,000
Total .....	19,613,080	22,688,666	18,893,223	23,695,000	27,103,523	24,945,000	23,000,000

Note:--Balances carried forward are due primarily to necessity of deferring work for which funds are deposited until the most practicable time. For instance, funds for sale area betterment are received in advance of cutting, but work cannot be started until cutting operations are completed. The time lag sometimes extends for several years, depending on the amount of preparatory work required in the sale area, weather conditions, etc.

Above obligations for 1962 include refunds to cooperators of \$155,286.





#### Sale Area Betterment

Reforestation with K.V. funds. Logged area after slash has been burned ready to be reforested by direct seeding or planting.



ALLOTMENTS &  
OTHER FUNDS

MAJOR VEH.  
SAIRCRAFT



STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS AND OTHER FUNDS

(Includes only those amounts which, by November 30, 1962, were actually received or programmed for 1963 or 1964. Since work for other agencies is performed on a service basis, at the request of those agencies and for their benefit, it is not practicable to estimate in advance the amounts to be received in some cases.)

Item	: Obligations, : 1962	: Estimated : Obligations, : 1963	: Estimated : Obligations, : 1964
Allotments from:			
Watershed Protection, Soil Conser-			
vation Service - For planning,			
installing improvement measures,			
and investigations in river			
basins in connection with			
watershed protection activities	\$858,455	\$1,483,900	\$1,628,000
Flood Prevention, Soil Conservation:			
Service - For measures primarily			
for flood prevention (works of			
improvement) .....	2,741,288	2,977,425	3,493,000
Great Plains Conservation Program,			
Soil Conservation Service - For			
research services, advice and			
guidance to agencies conducting			
nursery production and tree			
planting phases of the Great			
Plains Conservation Program ....	16,746	17,470	17,850
Expenses, Agricultural Stabiliza-			
tion and Conservation Service:			
For cooperation in administering			
the naval stores program .....	138,397	142,900	148,300
For assistance in the conserva-			
tion reserve program, primarily			
for expansion of production of			
tree seedlings .....	56,876	68,881	- -
Section 102 Agriculture Act, Soil			
Conservation Service - For tech-			
nical forestry assistance and			
specialists in recreation for			
preparation of resource conser-			
vation and development plans ...	- -	- -	100,000
Total, Allotments .....	3,811,762	4,690,576	5,387,150

(Continued on next page)

Item	Obligations, 1962	Estimated Obligations, 1963	Estimated Obligations, 1964
Allocations and Working Funds			
(Advances from other agencies):			
Oregon and California Grant Lands:			
BLM, Department of the Interior -:			
For construction, operation, and:			
maintenance of access roads,			
reforestation, and other			
improvements on the revested			
O&C Railroad grant lands admin-:			
istered by the Forest Service	814,228	1,420,000	1,000,000
Agency for International Develop-			
ment - For economic and tech-			
nical assistance programs .....	146,552	187,700	191,700
Office of Emergency Planning:			
For radiological defense training:	2,632	- -	- -
For emergency preparedness			
functions of Federal agencies .	- -	- -	70,000
Public Works Acceleration, Depart-			
ment of Commerce - For accel-			
erated public works program ...	- -	27,120,000	- -
Consolidated Working Fund, General:			
Agriculture:			
For carrying out responsibil-			
ities and authorities under the:			
Area Redevelopment Program:			
Technical assistance .....	1,500	27,000	- -
Operations .....	- -	51,000	88,760
Total, Consolidated working			
fund, General, Agriculture	1,500	78,000	88,760
Total, Allocations and Working Funds:	964,912	28,805,700	1,350,460
Trust Fund:			
Cooperative Work, Forest Service:			
Trust funds deposited by			
cooperators for the accomplish-			
ment of certain projects which			
are of mutual benefit to the			
Forest Service and such			
cooperators as follows:			
1. Construction and maintenance			
of roads and trails .....	1,446,258	1,300,000	1,300,000
2. Construction and maintenance			
of other improvements ....	408,930	450,000	450,000
3. Protection of national			
forests and adjacent			
private land .....	2,816,642	2,950,000	2,950,000
4. Sale-area betterment .....	12,521,123	13,550,000	16,550,000

(Continued on next page)

Item	: Obligations, : 1962	: Estimated : Obligations, : 1963	: Estimated : Obligations, : 1964
5. Scaling of timber .....	: 596,747	: 600,000	: 600,000
6. Research investigations ....	: 967,167	: 1,000,000	: 1,000,000
7. Administration .....	: 63,420	: 70,000	: 70,000
8. Reforestation .....	: 72,936	: 80,000	: 80,000
Total, Trust Fund .....	: 18,893,223	: 20,000,000	: 23,000,000
Obligations under reimbursements from Governmental and Other Sources:			
Forest protection and utilization a/ .....	: 3,209,606	: 6,000,000	: 6,000,000
Forest roads and trails and Roads and trails for States b/ .....	: 433,022	: 1,000,000	: 1,000,000
All other .....	: 590,792	: 1,278,000	: 904,240
Total, Reimbursements .....	: 4,233,420	: 8,278,000	: 7,904,240
TOTAL, OBLIGATIONS UNDER ALLOTMENTS AND OTHER FUNDS .....	: 27,903,317	: 61,774,276	: 37,641,850

a/ Primarily from other Government agencies, States, and counties, for forest fire protection and suppression, insect and disease control, forest research, investigations at Forest Products Laboratory, surveys, land appraisals, mapping, cruising timber, preparation of timber management plans, snow scale readings, and other miscellaneous services.

b/ Primarily road construction for U. S. Army.

NOTE: In addition, foreign currencies are available under Section 104(k) of Public Law 480 for forest research projects abroad. This work is conducted by the Agricultural Research Service of the Department of Agriculture with the assistance of the Forest Service in the review and appraisal of forest research projects undertaken abroad. The dollar expenses of the Forest Service in connection with this work are paid from the appropriation "Forest protection and utilization."



MOTOR VEH.  
SAIRCRAFT



## PASSENGER MOTOR VEHICLES AND AIRCRAFT

### Purchase of passenger motor vehicles

During fiscal year 1964 it is proposed to replace 126 passenger cars, 16 of which are station wagons, all of which will meet replacement standards. It is also proposed to purchase 58 additional passenger cars. In a few instances due to actual program needs, it may be necessary to substitute a sedan for a station wagon or vice versa at the time orders are placed which could make a minor change in the relative number of sedans and station wagons shown, but this would not change the total number of passenger motor vehicles scheduled for replacement and addition.

Based on the planned schedule of replacements and purchase of additional cars, the Forest Service will have a total of 706 passenger vehicles, including 4 busses, in fiscal 1964. It is expected that 243 units will meet or exceed replacement standards before replacements are received.

As of June 30, 1962, the age and mileage classes of the Forest Service net active fleet exclusive of 4 busses were:

<u>Age Data</u>		<u>Mileage Data</u>	
<u>Year Model</u>	<u>No. of Vehicles</u>	<u>Lifetime Mileage</u>	<u>No. of Vehicles</u>
1957 or older	101	80,000 to 100,000	7
1958	112	60,000 to 80,000	100
1959	80	40,000 to 60,000	148
1960	76	20,000 to 40,000	140
1961	98	0 to 20,000	221
1962	149		Total 616
Total	616		

### Use of vehicles

Passenger motor vehicles are used by (1) forest officers in the protection, utilization, management, and development of the national forests and land utilization projects and in the program for control of forest pests; (2) research technicians on experimental forests and ranges, on field research projects and forest surveys; (3) foresters engaged in carrying out the laws providing for State and private forestry cooperations; and (4) regional office field-going administrative officers in performing, directing, and inspecting field work.

The Forest Service is essentially a field organization and its passenger motor vehicles are located mainly at regional, national forest, and ranger district headquarters, and experimental forests and ranges. There are over 232 million acres within the exterior boundaries of the national forests. About 435 million acres of State and private forest land are included within the areas which benefit from Federal participation in the cooperative forest program. Much of this area is without common carrier service, and most forest areas and research centers are remote from commercial travel routes, requiring extensive use of motor vehicles as a means of transportation. The major

portion of transportation needs, particularly at forest regional and supervisor levels and at other larger headquarters involves multiple passenger use and can be more expeditiously and economically met by use of sedans and station wagons than by other types of vehicles.

#### Justification of replacements

Dependability of passenger vehicles is an important factor in keeping work programs on schedule and in meeting emergencies. Vehicle breakdowns while on field travel cause disruptions and delays in field work as well as loss of effective work time of employees. The continued use of over-age equipment is undesirable from a safety standpoint since most of it is operated over rough narrow winding roads in mountainous country under adverse conditions. This use generally results in excessive operating and repair expenses when vehicles reach or exceed replacement standards.

In order to maintain passenger cars in a safe and satisfactory operating condition, it is the policy of the Forest Service to schedule periodic preventive maintenance inspections, services, and tune-ups to reduce the necessity for costly repairs and major overhauls, and to minimize lost time resulting from field breakdowns.

It is desirable to maintain a reasonable balance in the age class of the passenger vehicle inventory. The age class distribution is based upon conforming with replacement standards which recognize that some units will be retired under the age standard and others under the use standard. Prescribed replacement standards, although applicable, are not always appropriate for all Forest Service vehicles because of the wide range of operating conditions and the comparatively short field season in many of the national forests at higher elevations. Decision on replacement of passenger vehicles which reach replacement age is based on an appraisal of each unit. This involves a review of the history record combined with a mechanical inspection of the vehicle's condition and repair liability. When such appraisal indicates that the vehicle is satisfactory for further service without unreasonable repair expenditures, it is retained and assigned to lighter work, even though such action tends to upset the age standards for the fleet inventory.

The vehicles selected for replacement are those which cannot be operated another season without excessive repair expense. They are unsatisfactory for further use both as to safety and mechanical condition. The replacement authorization requested is within the normal annual replacement standards prescribed by General Services Administration.

Essentially all passenger vehicles are pooled for use by all activities with replacement of pooled units financed from a Working Capital Fund. All appropriations reimburse this fund in ratio to use of vehicles on activities financed by the respective appropriations.

None of the replacements requested will be assigned to areas served or scheduled to be served by Inter-Agency Motor Pools of the General Services Administration.

#### Justification for the additional vehicles

The Forest Service analyzes current work plans and programs in determining its overall passenger car requirements. This analysis includes a careful

study of the number of vehicles needed at each field station, using as a guiding principle the ownership of only the minimum number of dependable units required to serve programs for which funds are budgeted. Also, it is Forest Service policy to utilize Inter-Agency Motor Pools of the General Services Administration, or commercial car rental services to the fullest practicable extent. Passenger car use is restricted and is integrated with various activities so as to attain good utilization of all vehicles. Expanding activities in research, timber sales, public use of recreational facilities, fire protection and other land management activities, are increasing the need for more passenger cars. These increasing needs are being met in some areas through greater use of Inter-Agency Motor Pool vehicles. These pools, however, serve only very small parts of the total land area administered by the Forest Service; therefore, increasing requirements for passenger car transportation in several areas cannot be fully met except through purchase of additional units for the Forest Service fleet. None of the additions requested will be assigned to areas served or scheduled to be served by Inter-Agency Motor Pools.

Additions are financed from program funds in direct relationship to the anticipated use of the equipment. Distribution of costs to appropriations is based on analysis of use of the equipment fleet for the past three years and the estimated use for the budget year.

#### Replacement and addition of aircraft

The 1964 estimates propose replacement of three aircraft by purchase, four by transfer from other agencies as available, and addition of two aircraft by purchase or transfer. The Forest Service currently has 58 aircraft:

- 12 light reconnaissance and transport airplanes
- 16 medium and heavy cargo and transport airplanes  
(10 medium; 6 heavy)
- 24 T-34B lead airplanes (2-place scout)
- 3 bomber-type airplanes (chemical tankers)
- 1 helicopter
- 2 forest spray airplanes (Stearman and TBM)

The reconnaissance and transport aircraft are used primarily to transport administrative personnel, firefighters, smokejumpers, equipment and supplies to remote and inaccessible areas where commercial service is inadequate, or not available for detection and suppression of forest fires. They are also used to locate and survey timber stand and vegetation conditions such as insect infestations, blowdown, diseased areas and undesirable species, and to appraise resources and damage and evaluate effectiveness of control.

The T-34B "lead" aircraft are used primarily by air attack bosses to direct and control the dropping of fire retardants on forest fires by more than 200 tanker aircraft (mostly contracted from private owners).

The bomber-type aircraft are used as air tankers for bulk dropping of retardants on forest fires, training Forest Service personnel as lead plane pilots, and developing and testing new and improved methods of dropping fire retardants.

The helicopter is used for training forest personnel in tactical use of helicopters and experimental development of techniques and equipment for direct tactical suppression of forest fires.

The two additional and two replacements requested will be light twin engine airplanes. They will be utility airplanes that may be used for several purposes, such as lead planes for air tankers, small paracargo dropping, reconnaissance, and transporting freight and passengers. The two additional aircraft are needed primarily for lead plane work in directing the dropping of fire retardants on forest fires by tanker aircraft. The dropping of fire retardants from aircraft has increased rapidly in the last few years. It is a costly operation requiring direct supervision and control to obtain the most effective results. Two present T-34B lead planes which do not have adequate performance and capabilities at higher elevations where work is required will be replaced by light twin engine airplanes. These will be new standard manufactured airplanes to upgrade the old surplus T-34B's and provide more effective operations with a wider safety margin.

It will be necessary to purchase a replacement for one reconnaissance aircraft which has reached an age and total number of flying hours on the air frame where it is uneconomical to overhaul or modernize it to meet Civil Air Regulation airworthiness requirements. Forest Service aircraft are operated to a large extent over a rough mountainous terrain where landing fields are poor and few. It is especially important that these aircraft be maintained for maximum performance and dependability to provide an adequate standard of safety. The replacement will be a new light twin engine aircraft which will provide greater efficiency and increased safety in case of engine failure than the present single engine aircraft now affords.

Other aircraft currently in use may be replaced as newer and more suitable models and types become available from military services as excess property. They would be obtained on transfer without reimbursement and would not increase the fleet beyond 60 aircraft. When aircraft are partially or completely destroyed in a crash accident they may be replaced out of any available fund. The majority of current Forest Service aircraft were manufactured during World War II and obtained from military surplus. Most of these planes have nearly reached their limit of useful age. The military services now have aircraft which have more potential suitability for Forest Service work that may become surplus in the near future. At present one reconnaissance and survey aircraft and a large cargo and personnel transport have reached the limit of economical usefulness.







